

Do you want to reduce your water's bill payment?

So, in the following article, based on an environmental science investigation project made by students who are doing their A levels, at "Los Navalmorales" High School, which is located in the village of Los Navalmorales in the province of Toledo (Spain) you will find the answer.

It is imperative that we be aware of the importance of the water, one of our most valuable resources, and this has been the case since the beginning of our times. The main part of the development of our past generations is related to their proximity to a river which provided the water the fields needed. An example of this could be the power that Ancient Egypt had thanks to the longest river in the world, the Nile, which feeds the nearest fields. As a result of this, farming is one of the most important activities in the area.

Sadly, nowadays water is a very limited resource, and that is a problem for which the governments of the most powerful countries are not concerned at all. Therefore, every one of us should take up some individual actions in order to stop the problem the best we can. In this project the main idea is to reuse water in a **model** house and, as a result, the money you can save.

Although water is one of our renewable resources, we must not waste it because we do not know whether the reserves can be limited in the near future.

Nowadays, climate change is receiving more attention thanks to people like Greta Thunberg, a girl whose actions have made people become more aware of this problem. This shows that it is possible to make changes from more parts of society, and makes us proud of exposing our project in different sectors of the society to help gain awareness of the main issue: the sustainable use of water.

The storm "Gloria" affected Spain in January and we have noticed that different areas of the Mediterranean coast were waterlogged. The floods were produced due to the rise in level of the Mediterranean Sea, which caused hundreds of fields to become unusable and it was necessary to wash them to be able to use them again. For this, a large amount of water is needed, that could be done with reused water, with this we would minimize the impact on our most precious resource.

The same events that occurred in Spain, have occurred all over the world. All of these events show us that we are facing a real global problem.

Our project has been carried out in some phases which can be summed up as:

- a) Search of information related with the water's chemical nature, its uses, sustainability, the importance of this resource in our society, different types of water, its pollution and methods of purifying it...

b) Creation of tables and graphs related with the water's consumption and saving, both economically and as a resource, that show the effectiveness of reusing grey waters.

c) Building of a model to demonstrate how grey waters can be reused and how its purifying process is possible.

d) Laboratory analysis to show the effectiveness of our water purifying process. This is done by measuring the COD (chemistry oxygen demand) of grey waters.

e) Writing the document with information and data gathered throughout our work.

According to all the calculations that we have done, the maintenance of water in our model house is about 129, 63 litres per person each day, of which residual water can be used in showers, washing machines and sinks (with 30 litres per person each day). The other 100 litres can't be reused, these are residual water for toilets and drinkable and cooking water.

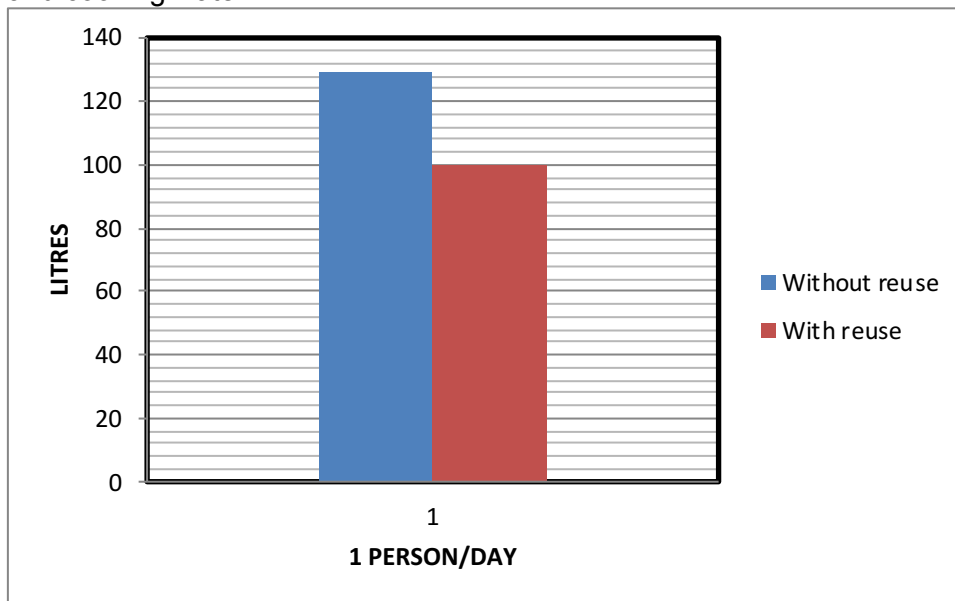


Image 1: The litres used by one person each day, with or without reuse.

Then, we would not need to use 90 litres of water on our model house, with 3 people in it, and in one year the total quantity is 32 850 litres, reducing each yearly payment 42 euros. The changes that must be done in the piping are not really expensive, with a cost of 150 euros, that means that in 3 years this could be worth the initial investment of residual water.

If we do this in all the houses of Los Navalmorales,, we would have 77 000 litres accumulated for different uses after its purification, for example to water the fields, because the main source of benefits for Los Navalmorales is the agriculture (mainly oil services). The agricultural use of the purified waters it ruled by specific regulations

(which means that its use is compulsory) that the European Union is preparing in order to regulate those uses of water previously mentioned.

The goal of the project is to encourage the use of the reused water as a healthy way for both people and the environment.

VILLAGES/TOWN	PERSONS	WATER GATHERED (LITRES)
Los Navalmorales	2570	77100
Toledo	687.084	20612520
Madrid	6.662.000	199860000

Image 2: Litres of water gathered in different locations (villages/towns, includes water which hasn't been used)

Nowadays, approximately 30% of the Europe's population do not have access to clean water in their daily lives and in the coming years this is going to get worse, unleashing terrifying consequences in terms of environmental, social or economic problems. Water is starting to be considered as a limited resource due to the aforementioned problems, which has fortunately an advantage: people are worried and aware of the use of water, changing their methods to others that are better for its collection.

Seeing the results, we think that it could be a good option to install in all construction buildings and even in those already built, a double net which collects water waste: on one hand, grey waters and, on the other hand, black waters. This double collecting system would increase our drinking water reservoirs.