Agrupamento de Escolas de Ponte de Sor
Escola Secundária de Ponte de Sor

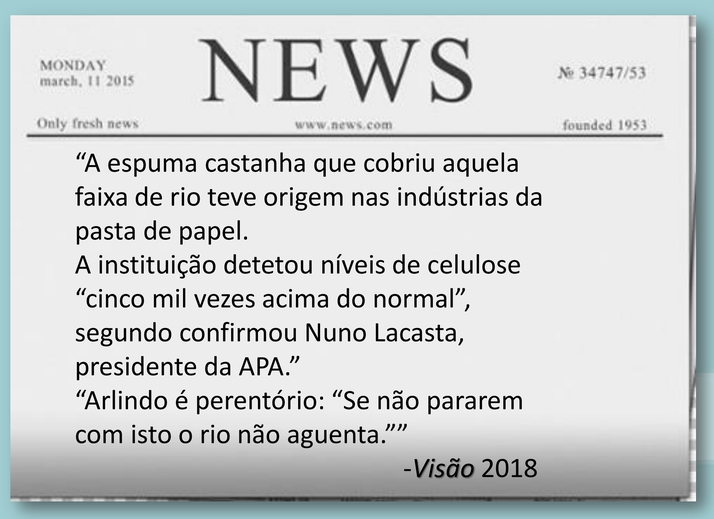
Polluted water can kill Portugal in a year?

Keywords: H_2O, pollution, eutrophication, aquifers, potable

Introduction: Clean and fresh water is essential to all life forms. Over the past 60 years, the world's population has doubled, water consumption has been multiplied by seven. We wasted about 40% of the treated water, while a quarter of the population in developing countries have no access to potable water. **10 million people**, equivalent to the Portuguese population, **die every year** due to the intake of polluted water.

1-What is water pollution?

Water pollution is the introduction of foreign particles to the natural aquatic environment, directly or indirectly, being potentially harmful to fauna, flora and the surrounding human populations or that use this water.



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"A espuma castanha que cobriu aquela faixa de rio teve origem nas indústrias da pasta de papel.
A instituição detetou níveis de celulose "cinco mil vezes acima do normal", segundo confirmou Nuno Lacasta, presidente da APA."
"Arlindo é perentório: "Se não pararem com isto o rio não aguenta.""

-*Visão* 2018

2- Do you know what is being dumped into our water?

- **From Industry**: high organic, chemical and toxic loads, extremely poisonous.
- **From farming**: chemical substances of animal feed (such as hormones), blood and guts from slaughterhouses and detergents used to wash pigsties, stables and aviaries.
- **From our homes**: organic matter, nutrients and micro-organisms carrying diseases.

What can I do to help?

- **Do not litter the streets, beaches, rivers or the sea.**
- **Put your household waste in an adequate and safe place so that it is not converted in marine litter.**
- **Do not waste water, at home or anywhere else.**
- **Channel all the water that is used by the population to a treatment station.**

together we can make a difference!

3-Consequences:

- **Deterioration of the quality of the water**
- **Contamination** of groundwater towels
- **Bad smell**
- **Eutrophication**
- Multiplication of **pathogens**
- Diseases such as **tuberculosis, hepatitis, cholera and diarrhea**
- **Death of living beings**

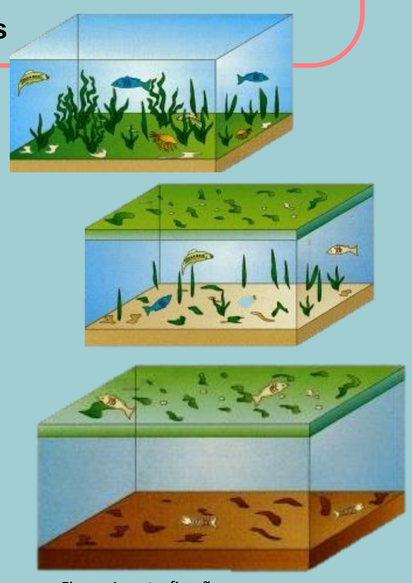

Figura 1- eutrofização

4-Can we be saved?

Yes! An aquifer is a subterranean geological formation that works like a water reservois, wich is fed by rainwater that is filtered through the subsoil. Aquifers are rocks with porous characteristics and permeable capabilities to retain and supply water for wells and springs in sufficiant amounts to serve as plentiful sources of water.

5.1-Confined Aquifer

Is delimited at the tops and bottons by mpermeable layers of rock.
- The water pressure is higher than the atmospheric pressure.
- Water recharge is slower because it is done laterally in a limited zone what is exposed to the surface.
- Water levels do not change much from season to season.

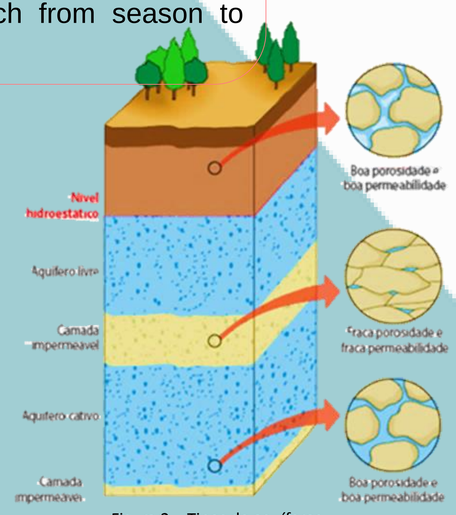

Figura 2 – Tipos de aquíferos

5.2- Unconfined Aquifer

- Is located between an upper permeable layer and a lower impermeable layer.
- Water pressure is equal to atmospheric pressure.
- Water recharge is faster because the upper layer is permeable and allows rainfale to pass directly through it to the aquifer.
- Water levels change greatly depending heavily on the changing seasons.

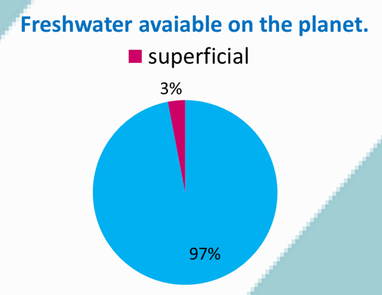

Figura 3 – gráfico

Sou água caindo nas matas
Brincando nas ruas
Virando cascata

Sou água descendo a serra
Adornando a colina
Entrando na terra

Sou água escorrendo dos montes
Enchendo os rios
Jorrando nas fontes

Sou água salgada
Nas praias, nos mares

Sou água doce
Nos rios, nos lares

Sou água que gera energia, vida,
saúde e alegria

Sou, hoje, água triste
Descendo o morro
Escondida na calha
Pedindo socorro

Salvem-me!

Alaíde Santos,
publicada no Cartaz
"Água: fonte de vida

6- The importance and use of Aquifers

- Represents 97% of the freshwater available on the planet.
- The aquifers rocks filter the water retaining:
  - -Pollutants,
  - -Bacteria
  - -And other types of residual matter.
- **It makes the water pure and perfect for drinking!**

7-Conclusion

Summing up, **water is the most important resource for our society and for our life on Earth**. Therefore, we call on for the **preservation** of this scarce resource, by **neither polluting, nor overloading it's caption in underground layers.**

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