CLIMATE DETECTIVES 2021 – 2022

Plastic World

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RESEARCH QUESTION

What are the reasons that lead the citizens of São Brás de Alportel not to carry out recycling properly?

SUMMARY OF PROJECT

According to pordata data from 2019, São Brás de Alportel has a very small number of waste separation, that is, a high number of tons of waste thrown away in an undifferentiated way and we would like to understand why. Portugal is also a country producing plastic waste above the European Union average.

To address this issue, we collect and analyze data, mainly from Pordata, allowing us to relate the amount of undifferentiated waste with the amount of waste collected selectively. We conducted a questionnaire to the school community to get a perception of their recycling habits.

At the same time, we studied the life cycle of plastic and synthesized a biodegradable potato starch polymer to understand its properties and possible applications. We also carried out an experimental activity, where bacteria cultures were made in water leached from a simulated landfill.

	Urban waste selectively chosen by inhabitant (Kg)		Total urban waste collected per inhabitant (Kg)	
Anos	2002	2020	2002	2020
Albufeira	32,6	385,5	1 227,1	1 153,1
Alcoutim	9,6	120,4	318,8	660,1
Aljezur	20,2	270,9	512,3	916,4
Castro Marim	25,4	309,9	666,2	1 063,9
Faro	20,2	162	579,5	685
Lagoa	33,5	342,6	841,2	986,8
Lagos	29,1	291,1	732,7	882,6
Loulé	28	321,9	801,2	950,5
Monchique	13,7	131,1	410,6	677,4
Olhão	16,1	221,1	499,7	702,2
Portimão	16,1	221,1	748,5	769,7
São Brás de Alportel	**16,8**	**176**	**466,6**	**597,7**
Silves	19,6	207,3	530,5	737
Tavira	19,2	221,7	572,3	844,9
Vila do Bispo	34,8	897,2	778,6	1 249,0
Vila Real de Santo António	21,4	252,7	736,2	900,9

Fontes/Entidades: INE, INE (até 2001) | INE APA/MA (até 2014) | INE (a partir de 2015). PORDATA
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Portugal produces above average plastic waste

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Each inhabitant is producing around 40.3 kilos a year and the country continues to send 33% of its waste directly to landfill



Figure 1: Urban waste selectively chosen in the Algarve region

MAIN RESULTS

Contrary to what was predicted, 80% of the school community says they have a habit of recycling. However, the evidence gathered in the differentiated garbage containers and ecopoints has shown us that there is still much to do about community awareness. The 20 % who do not recycle do so by devaluing this theme.

We realized that the production of biodegradable polymer from potato starch should be further explored technologically and industrially since its synthesis is simple and allows some applications of conventional plastic replacement.
The occurrence of bacteria in the water leached from the landfill was much higher than the temperature of 38ºC. These microorganisms allow to degrade a huge variety of natural substances present in landfills.



Figure 2: Experimental results: leach water bacteria culture and biodegradable plastic synthesis

ACTIONS TO HELP LESSEN TO THE PROBLEM



Figure 3: Plastic recycling awareness campaign

We posted posters by José Belchior Viegas Secondary School to draw the attention of the school community to the correct separation of waste and paint plastic collection containers. so as to make them more flashy. We held a lecture to the students of our school in order to sensitize them to the theme leading them to sign a declaration of commitment.
Declaration of commitment: "I commit myself to change my little habits for our planet, recycling properly until the end of my days and reuse everything that life allows me. Moreover, I feel obliged to reject excessive consumerism to preserve this beautiful planet, which is my home".