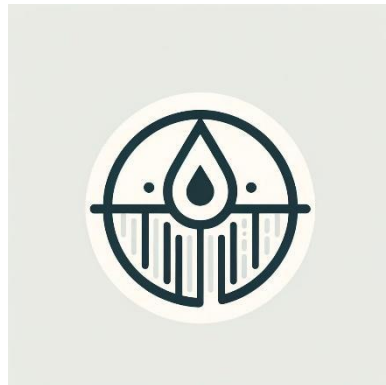




CitEuroPass The 2<sup>nd</sup> wave

**Clear Flow Company**

Frugal innovation – Erasmus+ documentation



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**Project overview:** This project aims to develop a sustainable water filtration system using microorganisms to ensure cost-effectiveness and reduce reliance on chemicals and plastic.

## **1. Company information**

We created this company with a clear purpose: to address the need for a sustainable filtration solution. Our journey began with the experience that almost everyone has had: encountering water that had questionable quality at home. In response, people often resort to plastic bottles or water filters for reassurance. But as we looked more closely, we discovered that many conventional water filters primarily consist of plastic. Motivated by the shared goal to nurture not only our bodies but also the environment, we decided to pursue a more sustainable path. To achieve this, we decided to focus on using microorganisms for water filtration – this method offers a lot of benefits including biological purification, sustainability, cost-effectiveness, and reduced reliance on chemicals. We are committed to providing effective, sustainable, and eco-friendly water filtration solutions through which we not only meet today's needs but also safeguard the health of future generations and the planet as a whole.

**Name: Clear Flow**

- **Clear** = clarity and purity of water,
- **Flow** = the movement and circulation of water through the filtration system.

**Product Name:** Crystal-clear

## **2. Product**

### **2.1 General idea**

How many times have you been very thirsty and when you drink water that should quench your thirst, you feel a strong metallic taste? It is said that home is where the water has no taste. This is how we set out to create our product that can solve this problem in a sustainable and environmentally friendly way. The water filter that uses microorganisms to purify water and

eliminate its metallic taste is the perfect solution. With a modern, minimalist design, suitable for any type of kitchen or office, easy to use and effective, *CrystalClear*, microorganism water filter is the perfect choice for anyone. Hydration is important, but more important is to hydrate with pure water.

## 2.2 Product Description

The product is made of PET-G, which can be considered sustainable for being recyclable (it can be melted down and reprocessed into new products multiple times without significant degradation in quality, reducing the need for virgin materials), durable and by this we are reducing the frequency of replacement and subsequent resource consumption. It also reduces waste through recycling.

The filters are made of cellulose which is also considered to be sustainable and eco-friendly because of its biodegradability, meaning it can be broken down by microorganisms into simpler compounds over time. This property reduces the accumulation of waste in landfills and oceans, unlike non-biodegradable materials like plastics. During their growth, plants absorb carbon dioxide from the atmosphere through photosynthesis to produce cellulose and it can be also very easily recycled.

The water used for the filtration needs to be at room temperature. Using hot water would kill the microorganism and the filtration would not bring the expected results.

### Filters



## 2.3 Product price

The price of one kilogram of plastic stands at 58 euros. Estimating the weight of the larger water filter (710x460x120) at 8 kilograms, we multiplied 8 by 58, totalling 464 euros including the price of the filter. However, considering the 19% tax required by Romanian law, the final amount becomes 647,36 euros. To achieve a 20% profit margin, the adjusted price is 776,8 euros. As for the smaller water filter (420x120x215), its price amounts to 404.6 euros. The price for the new filters, which will be reusable will be 60€/4 filters and 100€/ 8 filters. When setting the price we also considered the labour and manufactured costs.

**Crystal clear 710x460x120**

**Crystal clear 420x120x215**

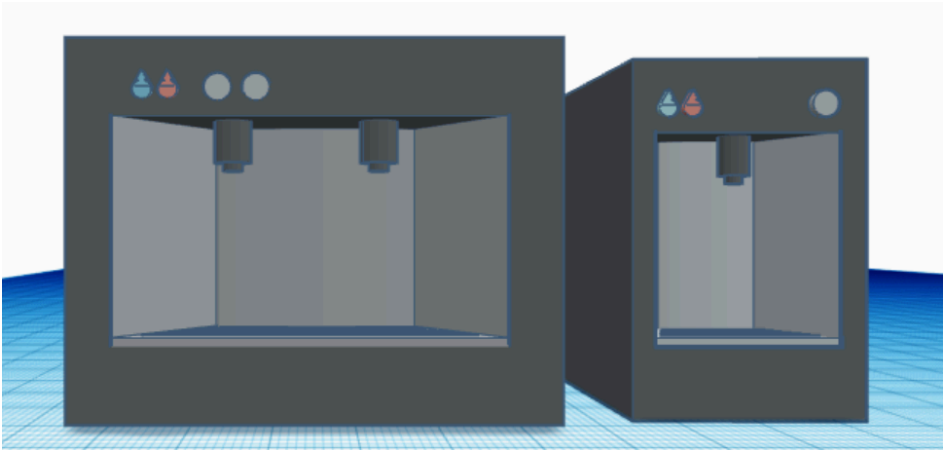


**production**

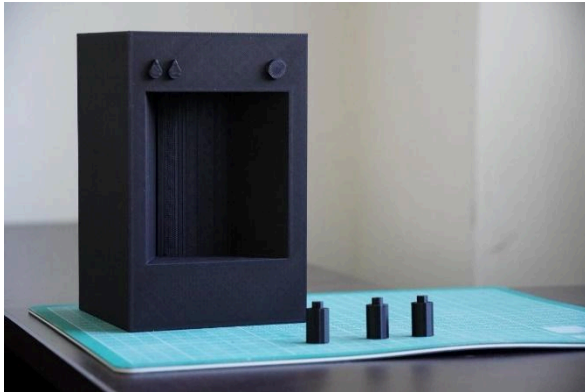
**2.4 Prototype**

We designed our prototype in Tinkercad and sequentially printed it in a 3D printer.

**3D model before printing**



### 3D model after printing



### 3. Issue that our product solves

The main issue that our product is trying to solve is to provide drinking water that does not have a metallic taste and is not contaminated. In addition, through our product, we try to resume the use of plastic by offering an alternative to drinking safe tap water instead of buying bottled water. We are also trying to reduce the use of regular filters that produce waste because they can not be recycled and also use chemical elements. The production of these filters is more harmful to the planet than the production of microorganism ones.

### 4. Biotechnology part

In the inner part of the product, there is a filter which has special bacteria in it called Streptomyces. We are cultivating those bacteria ourselves. As a quick recap, taking samples from different soils to decrease the failure possibility of cultivation, and then we heat the samples to 60 degrees Celsius for 30 minutes to kill almost all other undesired bacteria and let them wait in an incubator for 10 days with the agar nutrition for growing mature.

### Samples



## 5. Five aspects of the company

Using more filtered water at the expense of bottled water could help reduce pollution in several ways:

### 5.1. Sustainability

- 1) Improving the quality of the water: Ensuring that a wide range of people have access to drinkable water. We need to keep in mind that every drop of water is crucial. We can't miss any source of drinkable water and therefore our product can increase the amount of good-quality water.
- 2) Reducing plastic waste: Water bottling generates a significant amount of plastic waste, which pollutes the environment and affects aquatic ecosystems. Using a water filtration it could eliminate the need to buy plastic bottles and thus reduce the amount of plastic waste generated.
- 3) Reducing carbon emissions: The production and transport of bottled water requires higher energy consumption and carbon emissions associated with the manufacture of plastic bottles, bottling of water and its transport to consumers. Using a water filter at home or work can reduce these emissions, as no need for water transport and packaging.
- 4) Reducing resource consumption: The production of plastic bottles and bottling of water requires the use of resources such as oil or other raw materials and water. Using a water filter can reduce the consumption of these resources.
- 5) Reducing pollution due to manufacturing: Plastic bottle production and water bottling processes can cause pollution and affect air and water quality. Reducing the demand for bottled water can help reduce this impact on the environment.

### **5.1. Cost feasibility**

The feasibility study is very satisfying. Production costs are not much higher than the production costs of ordinary water filters. Also, maintenance costs are reduced, the product being very durable over time. At the same time, the economy can make using such a filter at the expense of buying bottled water. There are also environmental benefits, the sustainability of our product being optimal. Using this filtration secures the health benefits that result from filtering water with microorganisms and not with filters of any other kind.

### **5.2. Adaptability**

Our system can treat water from various sources and adjust to changing conditions. The system can locate specific contaminants in the water to ensure the purification is optimal. Through this product, we ensure that people have access to safe and clean water.

### **5.3. Simplicity & Scalability**

The product itself requires minimal maintenance and operational complexity. It functions with little human intervention and can be applied at different scales and adjusted to different volumes of water. This system offers a simpler and more accessible approach to water treatment due to reliance on natural processes instead of complex machinery and chemicals. The product itself is very simple which leads to easier installation, operation, and maintenance, making it accessible to a wider range of users, which promotes widespread adoption of sustainable water treatment practices.

## **6. Ecological Impact**

Water filters that use microorganisms, such as bacteria or other living organisms, can help remove contaminants such as viruses, parasites and more from the water. They can be effective



in improving water quality for human consumption in areas where drinking water is contaminated with pathogenic microorganisms. Regular water filters such as activated charcoal or membrane filters may require regular replacement of cartridges or membranes, which can generate waste.

The environmental effect of using such a filter is a positive one, reducing waste pollution by 40%. If you want to consume pure spring water with an eco-friendly filter and help reduce waste pollution, our product is the perfect choice.

## 7. Open-Source Contribution

**Testing and Fixing Problems:** Get help from testers who will try out our water filter and report any problems they find and change microorganisms occasionally.

**Social media:** Promoting our product through different social media channels and including influencers.

**Sharing Ideas and Tips:** Encourage people to share their thoughts and ideas on how to improve our water filter. We can learn from each other and make it even better together. We would have a review section on our website.

## 8. Our clients

The product will be adjusted to the specific clients.

1. **Offices** - We want to be as close as possible to our customers, which is why we have chosen to focus on their workplaces. There are several advantages that the offices would benefit from using our products. For example, it provides a much healthier working environment for their employees, which can increase their efficiency. Secondly, it can reduce the costs of large companies providing plastic water bottles to their employees. Lastly, it would considerably reduce the impact of pollution and reduce the usage of plastic.
2. **Families** - In a society that is trying to reduce the amount of plastic in everyday life and educate our children about protecting nature, families are the perfect customers. Parents always want the best for their loved ones in terms of quality and cost. Our products offer

both! First of all, it purifies water very successfully thanks to our micro-organisms. And secondly, our product is a real long-term investment, requiring much less maintenance than a conventional water filter.

- 3. School** – Students and teachers represent a large scale of potential customers to us because they spend a lot of time during the day in the school. Therefore, it is important to secure clean water for them and to show them/teach them how can they reduce plastic waste and adopt eco-friendly practices that would be beneficial for their future. By getting them used to using our product in everyday life, they will be able to talk about it to those around them and in the future they will even be able to buy our range their ones for families. At the beginning of each school year, we want to sell bottles which will reduce usage of the plastic bottles throughout the year and teach students/professors to more eco-friendly practices.

## 9. Competitors

### Indirect Competitor

Based on the European Commission, reducing the consumption of bottled water will help households save money and at the same time cut plastic waste and greenhouse gas emissions.

### Biggest competitors

- **Brita**

Our water filter costs 776,8 euros, much less than Brita's at 5000 euros. Compared to our filters which consist of microorganisms she uses she uses carbon filters to ensure a better quality of water. Compared to that one our product is simple, easy to use and maintain, cheaper and better for the environment.

- **Water Fontaine**

On average a water fountain costs 300 euro with a capacity of 20 liters and the water carboy costs on average 20 euro. So this solution is a bad investment due to the initial price of the fountain and of the water carboy being a little expensive. Then, this solution is not a solution for the ecological aspect because it uses a lot of plastic.

## **10.Added value**

The difference between us and the competitors is that we are using microorganisms, that help to remove the contaminants that are in the water. We not only want to improve the quality of the water but also in the long term to reduce the usage of plastic. Our system offers a simpler and more accessible approach to water treatment due to reliance on natural processes instead of complex machinery and chemicals. The product itself is very simple which leads to easier installation, operation, and maintenance, making it accessible to a wider range of users. Compared to the carbon filters we are trying to reduce plastic and polluted waste. This means that our filters are reusable and won't create more waste than the regular ones. We must develop a sustainable technology, that will be accessible to a wide range of people for whom the existence of drinking water won't be a problem anymore. This product represents an investment for the future for customers and in the long term it will save money compared to the competitors. The filters need to be changed once a year, but due to its reusability they do not create more waste than the regular ones.

## **11.Future Company Potential**

For the future, our company aims to develop the most sustainable technologies. The focus will be on developing a sustainable company with technologies that are accessible to a wide range of people, and to which the existence of drinking water is no longer a problem. A growing concern for the quality of potable water and the impact that water has on health, such as the diseases transmitted through contaminated water, we aim for the future to create as many sustainable products as possible and to reduce the level of pollution as much as possible. This planet is the only one we have, let's take care of it together.