



# Sustainable Water Filter

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**Abstract**  
The objective of this project was to design an alternative filter press to help reduce water pollution by being more efficient. We decided to design a water filter that has a high level of efficiency in terms of cost, time, and space. We conducted research on various water filtration methods and the materials that are used to create them. We then designed a water filter that is made of plastic and has a high level of efficiency in terms of cost, time, and space. We then designed a water filter that is made of plastic and has a high level of efficiency in terms of cost, time, and space.

**Revised Problem Statement**  
Since we didn't perform a customer needs survey, the initial problem statement will be revised here. As we design an alternative filter press that is made out of plastic materials, the product must be easy to assemble and use. Using our research as a guide, we decided that we need as the material that the filter press is made of, the material that make up the materials that are used for the filter assembly.

**Table 1. Hierarchical Customer Needs from Focus Group and Benchmarking**

- 1. Cost of filter
- 2. Availability of materials
- 3. Ease of assembly
- 4. Water quality (pH, TDS, etc.)
- 5. Ease of operation (pH)
- 6. Ease of cleaning
- 7. Durability of water filter

**Table 2. AHP Pairwise Comparison Chart to Determine Weighting of User Friendly Sub-Objectives**

Sub-Objective	1	2	3	4	5	6	7
1. Cost of filter	1	1/2	1/3	1/4	1/5	1/6	1/7
2. Availability of materials	2	1	1/2	1/3	1/4	1/5	1/6
3. Ease of assembly	3	2	1	1/2	1/3	1/4	1/5
4. Water quality (pH, TDS, etc.)	4	3	2	1	1/2	1/3	1/4
5. Ease of operation (pH)	5	4	3	2	1	1/2	1/3
6. Ease of cleaning	6	5	4	3	2	1	1/2
7. Durability of water filter	7	6	5	4	3	2	1

**Pugh Chart**

Sub-Objective	1	2	3	4	5	6	7
1. Cost of filter	1	1/2	1/3	1/4	1/5	1/6	1/7
2. Availability of materials	2	1	1/2	1/3	1/4	1/5	1/6
3. Ease of assembly	3	2	1	1/2	1/3	1/4	1/5
4. Water quality (pH, TDS, etc.)	4	3	2	1	1/2	1/3	1/4
5. Ease of operation (pH)	5	4	3	2	1	1/2	1/3
6. Ease of cleaning	6	5	4	3	2	1	1/2
7. Durability of water filter	7	6	5	4	3	2	1