



laboratorios
de aceleración



Climate Change Adaptation

Catalog of solutions mapped towards
Water scarcity and its quality



Collective Intelligence Challenge | Solutions Mapping

January – May 2023

Solutions catalog v.05.16

Water collection, irrigation & filtration

This catalog of solutions mapped has been built in stages, according to the learnings of each mini-cycle in relation to "adaptation to climate change", addressing water scarcity and alternative ways of collecting water, towards small agricultural producers in rural sectors in Guatemala.

The search for solutions has been based on grassroots solutions or mechanisms, as well as going back to learn from ancestral knowledge in water management. Other solutions are based on the ingenuity of other communities outside of Guatemala, facing the same challenges.

We have also identified "solutions" on expanding science-based technical knowledge, which in this catalogue have been excluded in order to focus on hands-on solutions that can be implemented by farmers.

For further information on water management institutions, papers, or academic research mapped towards building a community of practice, please reach us!



Paola Constantino
Head of Solutions Mapping

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Water harvesting and supply





(Techo, 2020)

Water collection and filtration tanks

Where it has been implemented:

El Durazno, Amatitlán, Guatemala

Proponent:

TECHO GT

Each figure represents an approximate value of 500 dollars. The figures in blue represent the need for cooperation for its implementation.

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figures the easiest



(Techo, 2020)

Description: The way these systems work is through the installation of PVC collecting gutters on the edges of sheet roofs. These gutters conduct rainwater into a water tank, where the water is stored. Once the water is stored, the beneficiary families can open a tap, which allows the passage of water through a filter that purifies the liquid, for later consumption.

Interesting features: It is a replicable method in different communities, since the organization has created a manual so that anyone can do it in their homes. In addition to capturing rainwater, it can filter it directly. The materials can be purchased at any hardware store and are relatively affordable.

Source: Techo Guatemala, 2020 / guatemala.techo.org | [Link](#)

Mapping method: Field research



(Asucuch, 2017)



(Asucuch, 2017)

Water collection tanks using the roof

Where it has been implemented:

Chiantla, Huehuetenango, Guatemala

Proponent:

ASUCUCH

Description: The Association of Organizations of the Cuchumatanes has promoted this project as a measure of adaptation to climate change, focusing on the effects of droughts. The system they use captures the water through sheets of Aluzinc, then conducts the water into a PVC channel and finally settles inside a water tank. At the bottom is installed a multi connector that allows the extraction of water.

Interesting features: It is a method that has been used in different communities and proven effective. It promotes collectivity and work among people in the community.

Source: Asucuch, 2017 / asocuch.com | [Link](#)

Mapping method: Digital

Each figure represents an approximate value of 500 dollars. The figures in blue represent the need for cooperation for its implementation.

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figures the easiest



(AquaLonis, 2017)



(AquaLonis, 2017)

Fog collectors

Where it has been implemented:
Monte Boutmezguida, Marruecos

Proponent: AquaLonis

Each figure represents an approximate value of 500 dollars. The figures in blue represent the need for cooperation for its implementation.

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figures the easiest

Description: The AquaLonis system is easy to install and is carbon neutral, as it does not use energy for its operation. Through their ultra-thin high-tech meshes, they extract the water that is in the air and collect it in containers that store the liquid ensuring that the quality is optimal for human consumption.

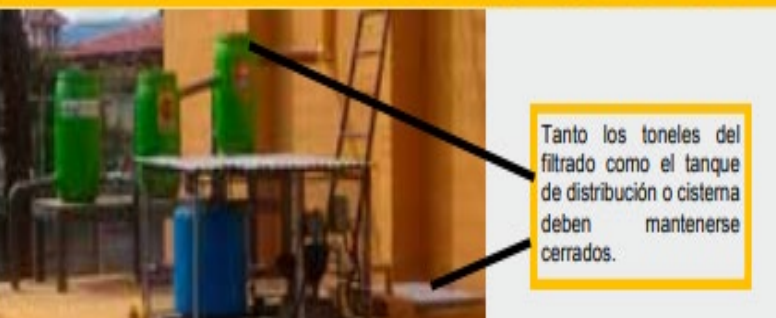
Interesting features: It is a method that not only captures water from the air but filters it so that it is suitable for human consumption. It is perfect for communities living in mountainous areas where it is difficult to bring water through pipes.

Source: AquaLonis, 2021 / aqualonis.com | [Link](#)

Mapping method: Digital



(GWP, 2018)



(GWP, 2018)

Collection tanks for schools

Where it has been implemented:

Zone 18 y 15, Ciudad de Guatemala, Guatemala

Proponent: Global Water Partnership

Each figure represents an approximate value of 500 dollars. The figures in blue represent the need for cooperation for its implementation.

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figures the easiest

Description: The municipality of Guatemala, together with Global Water Partnership have developed these pilot systems as a solution for water scarcity in urban areas of Guatemala.

Like other collection systems, these are based on the collection of rain by gutters installed on the roof, which lead the water to tanks that serve to contain the water.

Interesting features: It is an adaptation of water harvesting systems for communities, taken to a larger scale. This proves that it could be carried to even larger scales.

Source: Global Water Partnership, 2018 / gwp.org | [Link](#)

Mapping method: Digital

Traditional irrigation systems





(IAGUA, 2022)



(IAGUA, 2022)

Drip irrigation

Where it has been implemented:
Guadalajara, México

Each figure represents an approximate value of 500 dollars. The figures in blue represent the need for cooperation for its implementation.

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figure the easiest

Description: This system is used in lavender plantations in Guadalajara and Cuenca. The system is ideal for this type of crops, since spraying of the aerial part of the plant is avoided, so that the flowers or leaves of the plant are not damaged.

Interesting features: through the installed piping system, the plants receive water constantly and evenly, ensuring that they receive the right amount for their development.

Source: IAGUA, 2022 / iagua.es | [Link](#)

Mapping method: Digital



(Agro Nayade, 2020)



Krishi Jagran, 2020)

Sprinkler irrigation

Where it has been implemented:
Santa Cruz, Bolivia

Each figure represents an approximate value of 500 dollars. The figures in blue represent the need for cooperation for its implementation.

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figures the easiest

Description: The mechanism works through a network of pipes that transport water to the sprinklers, which use pressure to trigger it. Basically, it seeks to imitate the way in which rain would naturally irrigate these plants. In this case, the implementation of this irrigation produced better quality potatoes and quadrupled the production compared to traditional irrigation.

Interesting features: this type of irrigation ensures to be able to water the entire plant and provides the necessary moisture to the entire soil.

Source: Agro Nayade, 2020 / Agronayade.com | [Link](#)

Mapping method: Digital



(Agro Cereval, 2019)



(Agro Cereval, 2019)

Subterranean Drip Irrigation

Where it has been implemented:
Ciudad Real, España

Each figure represents an approximate value of 500 dollars. The figures in blue represent the need for cooperation for its implementation.

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figures the easiest

Description: Underground drip irrigation is a method that involves applying water under the soil surface. To install this type of irrigation heavy machinery is necessary, since several trenches need to be opened on the sides of the crops, in order to install pipes, pumps, etc. Through automated processes, the flow and amount of water that plants receive directly into the roots can be regulated.

Interesting features: reduces the amount of water evaporation that happens and allows you to make better use of irrigation.

Source: Agro Cereval, 2019 / Agrocereval.com | [Link](#)

Mapping method: Digital



(IICA, 2021)



(IICA, 2021)

Irrigation with vessels

Where it has been implemented:

Chile

Each figure represents an approximate value of 500 dollars. The figures in blue represent the need for cooperation for its implementation.

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figures the easiest

Description: Millennial system that requires no energy and uses only the water that plants need. In addition, it employs artisans, contributes to food security, is cheap and biodegradable.

Through a system of transpiration, the vessels provide the necessary water to the plants that settle near them. The plants use the water they need and have a reserve at their fingertips, which allows them to reduce water stress in the dry season.

Interesting features: it uses millenary technologies that allow to reduce water consumption and have no negative environmental impact.

Source: IICA, 2021 / iica.int/en | [Link](#)

Mapping method: Digital



(Utah Farm, 2022)



(Utah Farm, 2022)

Gravity irrigation

Where it has been implemented:
Different parts of Latin America

Each figure represents an approximate value of 500 dollars. The figures in blue represent the need for cooperation for its implementation.

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figure the easiest

Description: These irrigation systems work by taking advantage of the capacity of water to travel the path of the crop on its own. It does not need pumps and can be used to water your garden temporarily or throughout the season. It is also used in individual plants, orchards or row crops.

Interesting features: it is an excellent solution when crops demand large amounts of water.

Source: Prismab, 2019 / Prismab.com | [Link](#)

Mapping method: Digital

Hydroponic Systems



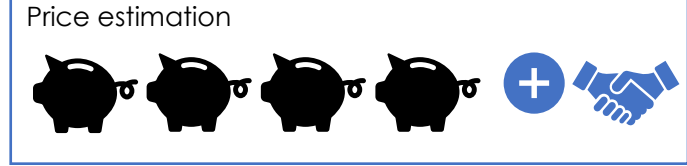


(Hidroponia Mx, 2016)

NFT

Where it has been implemented:
Guatemala

Each figure represents an approximate value of 500 dollars. The figures in blue represent the need for cooperation for its implementation.



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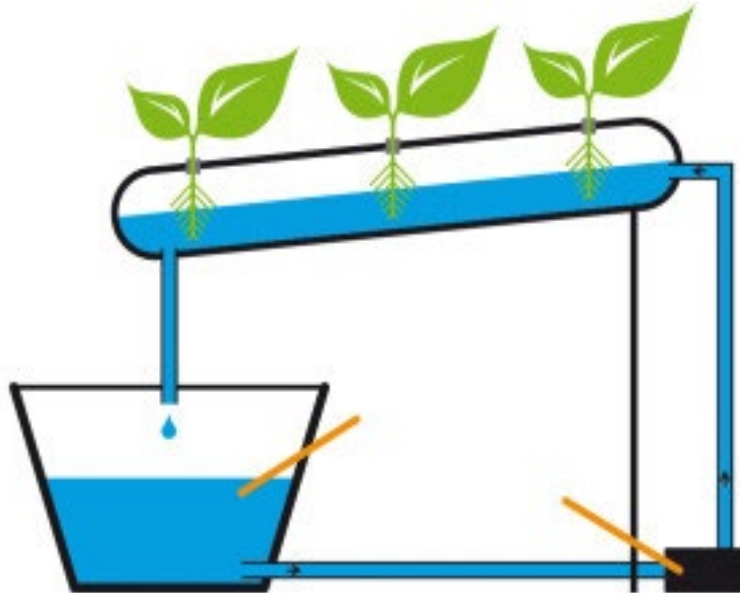
Description: It is a technique where nutrients are pumped from a reservoir, and it is not necessary to manipulate plants.

This technique ensures the safety of the products, since it occurs inside large greenhouses that regulate the temperature and also protect crops from diseases or insects that may affect the crop.

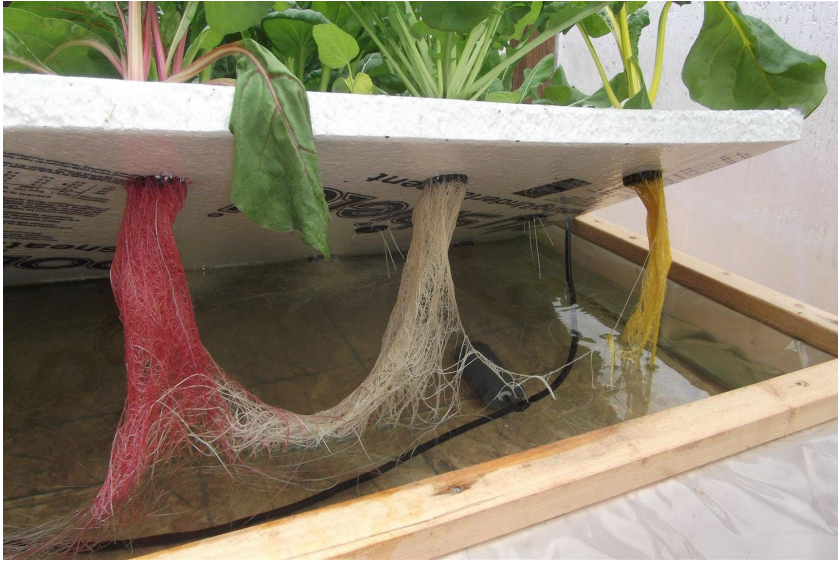
Interesting features: Many plants can be grown in small spaces, since horizontal or vertical systems can be made, depending on the amount of space available.

Source: ASI GREEN, 2015 / Youtube.com/@porlagentewm | [Link](#)

Mapping method: Digital



(Generación Verde, 2017)



(Portal Frutícola, 2019)



(Generación Verde, 2017)

Floating Root System

Where it has been implemented:
Nicaragua

Each figure represents an approximate value of 500 dollars. The figures in blue represent the need for cooperation for its implementation.

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figures the easiest

Description: In this method, the plants are found in a sheet or raft – usually made of duroport – that floats on top of the nutrient solution, so that their roots are immersed within the solution. An air pump provides the roots with the oxygen necessary for their optimal development.

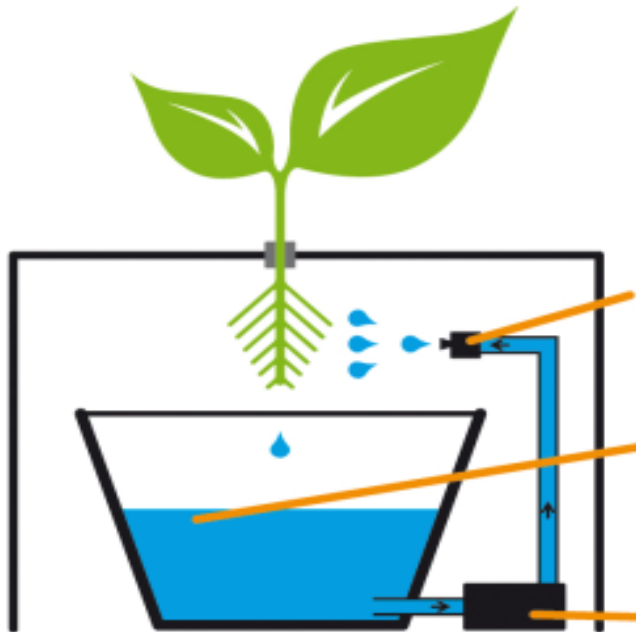
Interesting features: Only one water base is used for all plants. The nutrient solution is regulated directly in the water tank.

Source: JINOTEGA, 2021 / [Youtube.com/@rinconhidroponico4764](https://www.youtube.com/@rinconhidroponico4764) | [Link](#)

Mapping method: Digital



(Argen Papa, 2022)



(Generación Verde, 2017)

Aeroponics System

Where it has been implemented:

Nicaragua

Each figure represents an approximate value of 500 dollars. The figures in blue represent the need for cooperation for its implementation.

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figures the easiest

Description: technique in which the roots are suspended in the air, within a dark medium, and watered with nutrient solution in frequency of a few minutes. Although it is a highly efficient technique, the roots can quickly dry out irrigation cycles are disrupted.

Interesting features: It is watered directly to the root and the roots do not need to be in contact with water directly.

Source: Santa María TV, 2014 / [youtube.com/@canalsantamaria](https://www.youtube.com/@canalsantamaria) | [Link](#)

Mapping method: Digital



(GroHo, 2020)



(Generación Verde, 2017)

Drip Irrigation System

Where it has been implemented:

Costa Rica

Each figure represents an approximate value of 500 dollars. The figures in blue represent the need for cooperation for its implementation.

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figures the easiest

Description: In these irrigation systems, a timer controls a pump that causes the nutrient solution to drip onto the bottom of the plants. In some of these systems, it is possible to recover excess nutrient solution for reuse, while in others excess solution is discarded.

Interesting features: it is a hydroponic system where it is necessary to have soil to cultivate, but the water is used very efficiently.

Source: Tico Harvest, 2020 / Youtube.com/@TicoHarvest | [Link](#)

Mapping method: Digital



(The Spruce, 2022)

Ebb and flow system

Where it has been implemented:
Different countries in Latin America

Each figure represents an approximate value of 500 dollars. The figures in blue represent the need for cooperation for its implementation.

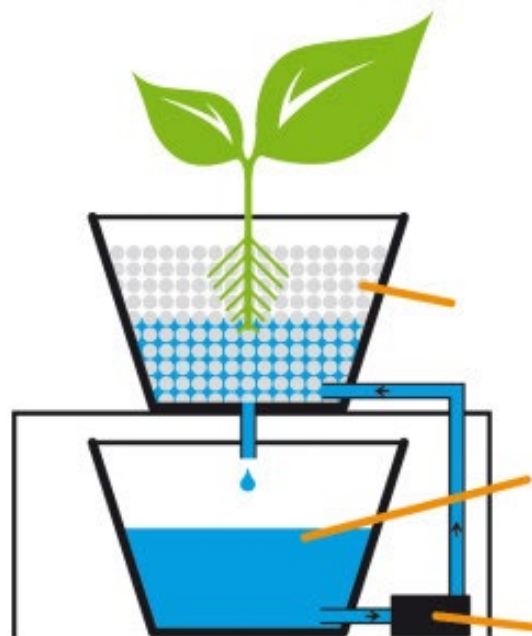
Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figures the easiest



(Generación Verde, 2017)

Description: In a ebb and flow system, plant pots are temporarily flooded with nutrient solution and then drained back into the reservoir. The flow is caused by a pump connected to a timer that is activated several times a day. When it stops working, the solution flows back into the tank.

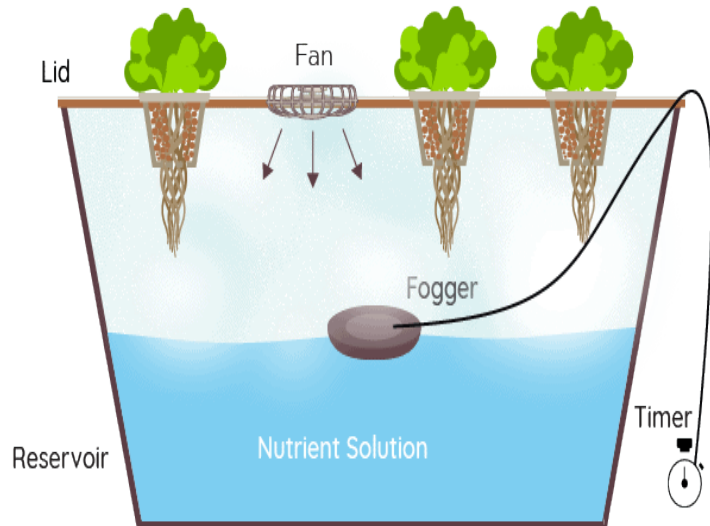
Interesting features: the nutrient solution can be used many times, as it only floods the pots for a specific time and then returns to the reservoir.

Source: Petani Kota, 2018 / youtube.com/@PetaniKota87 | [Link](#)

Mapping method: Digital



(Assignment Point, 2023)



(Generación Verde, 2017)

Mist system

Where it has been implemented:
Australia

Each figure represents an approximate value of 500 dollars. The figures in blue represent the need for cooperation for its implementation.

Price estimation



Degree of difficulty



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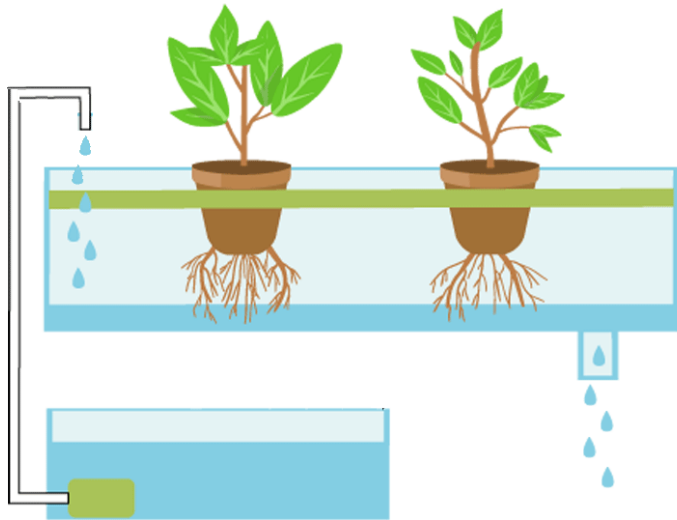
Description: The system uses electric nebulizers (fog machines) that pump and vibrate under pressure to transform the mixture of nutrients and water into moisture, such as the humid atmosphere of a tropical or cloud area. This creates a constant moist, nutrient-rich fog for plant roots.

Interesting features: the water is used very well, since small amounts are needed to create the mist that nourishes the plants.

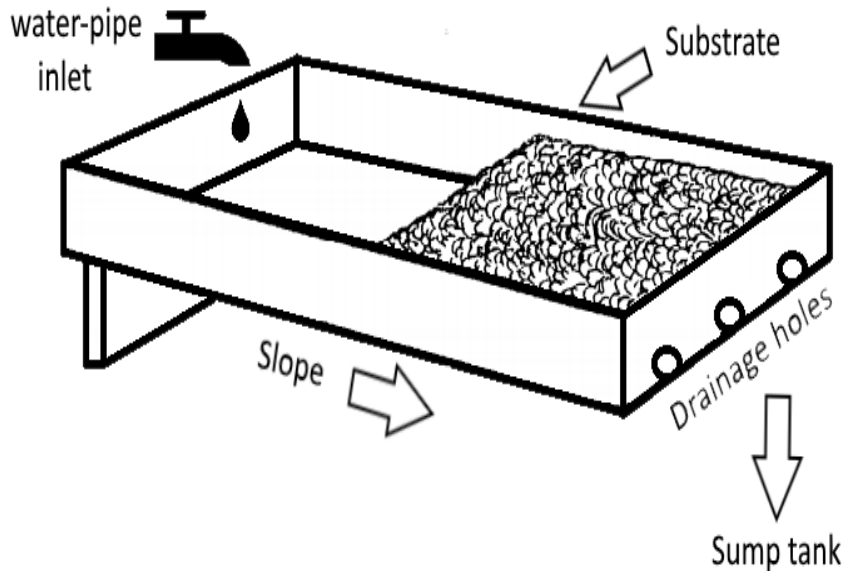
Source: Hoochos, 2021 / Youtube.com/@Hoocho | [Link](#)

Mapping method: Digital

Run To Waste - Falling Water



(Wiki Wand, 2022)



(Wiki Wand, 2022)

Run To Waste System

Where it has been implemented:

Australia

Description: In this system, nutrients are not recycled, but the plant receives a new mixture of nutrients constantly. The nutrients that have already been used are discarded by a final drain.

These systems typically use a substrate with a liquid retention similar to that of soil. That is, substrates maintain a high degree of humidity for a long period of time.

Interesting features: In this system there is no nutrient depletion, since the plant receives fresh nutrients at each intake.

Source: Glandore Hydro, 2017 / glandorehydro.com | [Link](#)

Mapping method: Digital

Each figure represents an approximate value of 500 dollars. The figures in blue represent the need for cooperation for its implementation.

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figures the easiest

Substrates for Hydroponic Systems



Each figure represents an approximate value of 500 dollars.

Rock wool

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figures the easiest



(Hempitecture, 2022)



(Maximum Yield, 2020)

Description: Rock or mineral wool can retain large amounts of water and air that aid root growth and nutrient absorption in hydroponics; Its fibrous nature also provides a good mechanical structure to keep the plant stable. The naturally elevated pH of mineral wools makes them initially unsuitable for plant growth and requires "conditioning".

Rockwool is usually used only in the seedling phase or with freshly cut clones, but can remain with the base of the plant throughout its life.

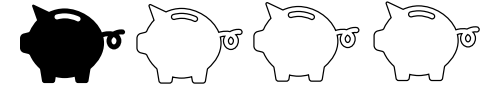
Source: Hydro Environment, 2020 / hydroenv.com.mx | [Link](#)

Mapping method: Digital

Each figure represents an approximate value of 500 dollars.

Clay Pellets

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figures the easiest



(Filp Kart, 2023)



(Top Soil, 2020)

Description: Fired clay pellets or granules are suitable for hydroponic systems in which all nutrients are carefully controlled in the aqueous solution. Clay granules have a neutral pH and do not contain any nutritional value.

The clay is formed into round granules and baked in rotary kilns. This causes the clay to expand, like popcorn, and become porous. It is lightweight and does not compact over time. The shape of each granule can be irregular or uniform, depending on the brand and manufacturing process.

Source: Hydro Environment, 2020 / hydroenv.com.mx | [Link](#)

Mapping method: Digital

Each figure represents an approximate value of 500 dollars.

Glass stone or "Growstones"

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figure the easiest



(Hali Fax Seed, 2023)



Description: This substrate is a 100% natural and recycled growth medium, perfect for vegetables, herbs and flowering plants. The spaces between the recycled glass "rocks" open up more oxygen to the plant roots, while the texture of the rock retains water without drowning the roots. This combination favors the development of the root, which translates into a better absorption of nutrients and water.

In addition, it is a lightweight material and does not dirty the media where it is used.

Source: Hydro Environment, 2020 / hydroenv.com.mx | [Link](#)

Mapping method: Digital

(Sub Urban Landscape Supply, 2023)

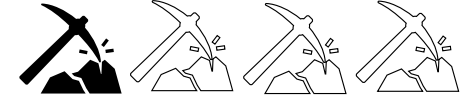
Each figure represents an approximate value of 500 dollars.

Coconut Fiber

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figure the easiest



(Herograespeciales, 2023)



(Fulán T., 2023)

Description: Coconut fiber is a material that is extracted from coconuts, in order to reuse the organic matter that remains as waste when extracting the edible part of the coconut. It is very good for hydroponics as it retains moisture and is not compacted, which guarantees that there is oxygen, and that water circulates correctly throughout the crop.

Eventually it degrades and it is necessary to periodically change the substrate of hydroponic crops. One of the advantages of this product is that it can be obtained at a lower cost than other substrates, due to the fact of being extracted from a waste.

Source: Hydro Environment, 2020 / hydroenv.com.mx | [Link](#)

Mapping method: Digital



(Nomen Foods, 2022)



(Nomen Foods, 2022)

Rice Husk

Each figure represents an approximate value of 500 dollars.

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figures the easiest

Description: Rice husk is a by-product of the milling industry, which is abundant in the rice areas of many countries and offers good properties to be used as a hydroponic substrate. Among its main properties are that it is an organic substrate with a low decomposition rate, it is light, good drainage, good aeration and its main cost is transportation.

The main drawback of rice husk is its low moisture retention capacity and how difficult it is to achieve a good distribution of it when used as a single substrate in hydroponic cultivation.

Source: Hydro Environment, 2020 / hydroenv.com.mx | [Link](#)

Mapping method: Digital

Filtration Solutions





(Ola Filter, 2022)

OLA
FILTRO / FILTER

(Ola Filter, 2022)

OLA Filter

Where it has been implemented:

Guatemala

Proponent:

OLA Filter

Description: The OLA filter offers a solution for communities with access to a water source through pipes, but that is contaminated or unfit for human consumption. Through tiny fibers, all contaminants in the water are trapped.

It should only be connected to the outlet of the "Jet" and the water that comes out of the filter is completely filtered.

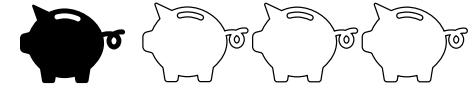
Interesting features: It is an instant filter and it is also portable.

Source: Ola Filter, 2023 / OlaFilter.com | [Link](#)

Mapping method: Digital

Each figure represents an approximate value of 500 dollars.

Price estimation



Degree of difficulty



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(EcoFiltro, 2022)



(EcoFiltro, 2022)

ECO Filter

Where it has been implemented:
Guatemala

Proponent:
ECO Filtro

Each figure represents an approximate value of 500 dollars.

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figure the easiest

Description: ECOFILTRO is an ecological and aesthetic water purifier, dispenser and filter made from natural elements. Its filtration technology consists of: activated carbon, mud and colloidal silver. It is perfect for homes, workplaces or shared areas where water is needed for drinking.

Interesting features: It is a Guatemalan invention, it is economical and durable.

Source: ECO Filtro, 2022 / EcoFiltro.com.gt | [Link](#)

Mapping method: Digital



(LifeStraw, 2023)

LifeStraw[®] 
by VESTERGAARD

(LifeStraw, 2023)

Filter Straw

Where it has been implemented:

Different countries

Proponent:

Life Straw

Description: It is a method to filter any type of water. The straw can filter from the water coming out of the jet, to water from river, lake or wells. It is ideal for communities that do not have access to piped water and the bodies of water to which they have access are contaminated.

Interesting features: It is portable, so it can be taken to very remote communities.

Source: Life Straw, 2020 / LifeStraw.com | [Link](#)

Mapping method: Digital

Each figure represents an approximate value of 500 dollars.

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figures the easiest



(WFL, 2023)



(WFL, 2023)

Water Filter

Where it has been implemented:

Atitlán, Guatemala

Proponent:

Water For Life

Description: Water for Life filters connect directly to the "jet" of the battery or any place where the water outlet is. Its filtration is almost immediate and protects people from diseases they can contract from drinking contaminated water.

Interesting features: It is a low-cost filtration method, accessible to communities living in Atitlan.

Source: Water For Life, 2023 / Water4lifeglobal.org | [Link](#)

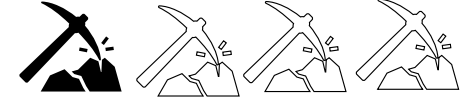
Mapping method: Digital

Each figure represents an approximate value of 500 dollars.

Price estimation



Degree of difficulty



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(Purificadores para Agua, 2022)



(Helisa, 2020)

Ozone Filter

Where it has been implemented:
Different Countries

Proponent:
Different companies

Description: Ozone filters are an excellent filtration method for communities that have access to piped water. It can be installed in a community center where people have access during certain hours of the day to filter water for consumption.

Interesting features: It is a widely known method and can be useful for many people.

Source: Sana Life, 2023 / SanaLifeWellness.com | [Link](#)
Mapping method: Digital

Each figure represents an approximate value of 500 dollars.

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figures the easiest



Bucket and Candle Filter

Where it has been implemented:

Different Countries

Proponent:

KATADYN ROPYDIN

Description: Similar to traditional filters such as the eco filter, but in this case the filtration is done by a "candle" that is horizontal. It is supplied without the water containers, which must be purchased locally. It can be purchased as a siphon kit, with a tube connected to the filter that channels the water to a drinking water container.

Very easy to use. Maintenance is performed by cleaning the candle periodically, this being the safety mechanism.

Interesting features: It is easy to transport and its maintenance is simple.

Source: katadyn Group, 2023 / Katadyngroup.com | [Link](#)

Mapping method: Digital

Each figure represents an approximate value of 500 dollars.

Price estimation



Degree of difficulty



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(Katadyn Group, 2020)

KATADYN GROUP
SWITZERLAND

(Katadyn Group, 2020)



Membrane Filter by Pumping

Where it has been implemented:
Different Countries

Proponent:
Water Roam

Each figure represents an approximate value of 500 dollars.

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figures the easiest

Description: ROAMfilter Plus is a diaphragm filter with an intuitive design in the form of a bicycle pump. The filter cartridge has pores of size $0.02 \mu\text{m}$. It is used by holding it with the feet and pumping with the handle to pass the water from the source through the filter and to the integrated tap. It can also be used in a gravity-driven installation. The device weighs 4.2 kg.

Interesting features: The filtration flow rate is quite high compared to other filters. In addition, it is easy to transport to distant communities.

Source: WaterRoam, 2022 / Wateroam.com | [Link](#)

Mapping method: Digital

(Wateroam, 2020)



(Wateroam, 2023)



(Hydroaid, 2021)



(Hydroaid, 2021)

Bio Sand Filter

Where it has been implemented:
Different Countries

Proponent:
Hydraid

Description: It is a plastic container filled with sand and gravel, into which water is poured periodically. The biolayer of microorganisms that is created on the surface of the sand filters and removes pathogens from the water, which flows by hydrostatic pressure or siphon to a container of clean water. Sand and gravel are sourced locally.

Interesting features: It is one of the few technified bio sand filters for sale in the market. It also promotes community activation, as some materials must be obtained.

Source: Hydraid, 2022 / Hydroaid.org | [Link](#)
Mapping method: Digital

Each figure represents an approximate value of 500 dollars.

Price estimation



Degree of difficulty



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(Solar Solutions, 2019)



(Solar Solutions, 2019)

Solar Pasteurization

Where it has been implemented:

Different Countries

Proponent:

Solar Solutions

Description: It is a portable pasteurization device that combines solar and thermal energy. It consists of a 5-liter polythene bag with a clear plastic bubble lining on the front and black plastic on the back.

It is placed under direct sunlight, where pasteurization is achieved thanks to the incidence of solar rays on the black layer. AquaPak has an indicator on the cap that warns the user that the treatment is finished.

Interesting features: It uses solar energy to operate.

Source: Solar Solutions, 2020 / SolarCleanWaterSolution.com | [Link](#)

Mapping method: Digital

Each figure represents an approximate value of 500 dollars.

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figure the easiest

Slow Sand Filter

Where it has been implemented:

Different Countries

Proponent:

Open technology

Description:

These filters are excellent for communities where there is no access to more efficient technologies. Through different layers of sand and gravel, the contaminants are filtered out through the final duct. It is important to emphasize that this type of filter is not effective for viruses, so other purification options should be considered beforehand.

Interesting features:

It is easy to do and can be done without great technification.

Source: Agua & Ambiente, 2021 /AguayAmbiente.com | [Link](#)

Mapping method: Digital

Each figure represents an approximate value of 500 dollars.

Price estimation



Degree of difficulty



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figures the easiest



(Agua y Ambiente, 2015)

Measurement of water-related climate variables





(Acc Lab, 2023)



(Acc Lab, 2023)

Rainfall gauges for measurements with local farmers

Where it has been implemented:

Santa María de Jesus, Sacatepéquez, Guatemala

Proponent:

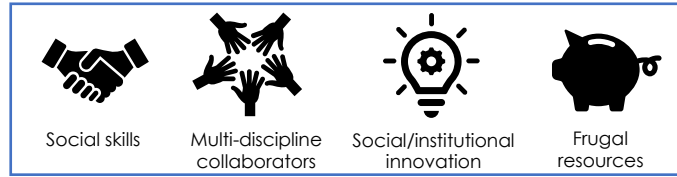
Solutions Mapping, Acc Lab GT, Producer Associations (VEGESXA CICODUMA), Tikonel

Description: Homemade rain gauges were designed to be able to carry out rainfall measurements in the farmlands of the producers' associations. The device is a replicable frugal solution, which allows to know the availability of rain in an area. Through these measurements, farmers can make more informed decisions about their land.

Interesting features: The design was made based on the needs of the farmers. We were able to obtain this information through participatory workshops that we carried out previously with them.

Source: Solutions Mapping, Acc Lab Guatemala | [Link](#)

Requiriments to implent



Degree of difficulty to implement with counterparts



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figures the easiest



(Acc Lab, 2023)



(Acc Lab, 2023)

Arduino Humidity and temperature sensor for measurements with local farmers

Where it has been implemented:

Santa María de Jesus, Sacatepéquez, Guatemala

Proponent:

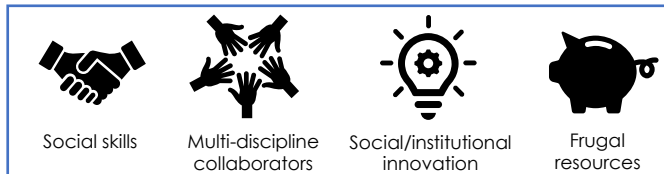
Solutions Mapping, Acc Lab GT, Producer Associations (VEGESXA CICODUMA), Tikonel

Description: Humidity and temperature sensors were designed to be able to carry out these measurements in the farmlands of the producers' associations. The device is a replicable frugal solution, but it takes some programming knowledge to prepare it. Through these measurements, farmers can make more informed decisions about their land.

Interesting features: The design was made based on the needs of the farmers. We were able to obtain this information through participatory workshops that we carried out previously with them.

Source: Solutions Mapping, Acc Lab Guatemala | [Link](#)

Requiriments to implent



Degree of difficulty to implement with counterparts



This scale represents the difficulty of implementation, with 4 figures being the most difficult and 1 figures the easiest

We will keep moving forward!

Paola Constantino

Head of Solutions Mapping

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<https://www.undp.org/acceleratorlabs>





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