



# POSTER 1: AQUAPONIC SYSTEM MANUAL



## Benefits

With food insecurity rising within Namibia as droughts and floods leave food productions dwindling, aquaponic and hydroponic systems have the ability to provide reliable food productions. Food insecurity, meaning that individuals do not have reliable access to a sufficient quantity of affordable, nutritious food, impacts 430,000 Namibians. While living in a Drought State of Emergency, this crisis is expected to worsen if no changes are made.



**430,000** Namibians **food insecure**

(Food and Agriculture Organization of the United Nations, 2020)



Average **food production down 42%**

in 2019  
(UNICEF, 2019)



**70% of food imported**

from South Africa in 2019  
(BBC News, 2019)



**Drought State of Emergency** declared in

2019  
(UNICEF, 2019)

## Materials

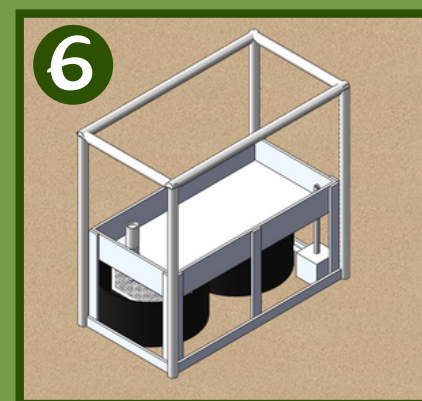
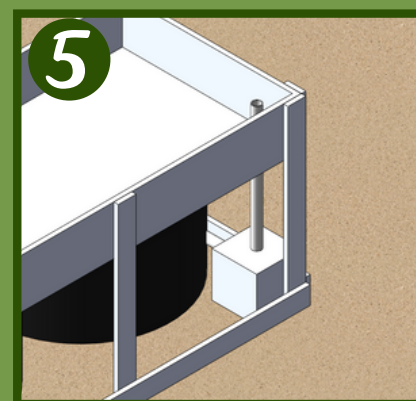
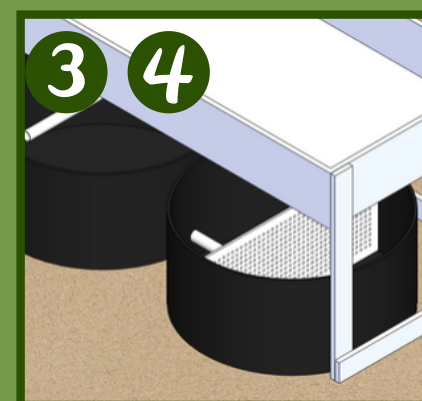
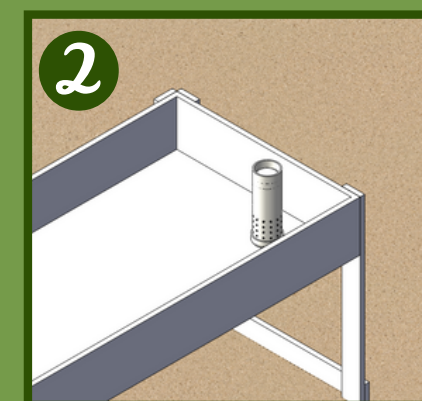
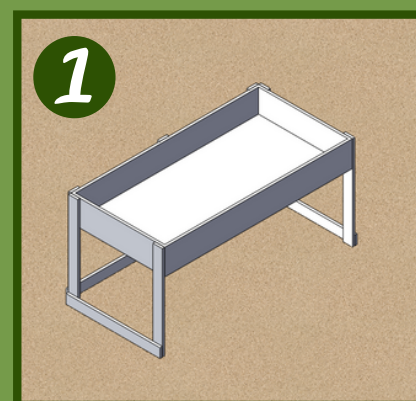
- **Pump:** This is necessary to cycle water through the system.
- **Aerator:** This is also necessary to provide the plants and fish with oxygen.
- **Plastic Mold** (200L or equivalent sized bin): This is to house the fish in and will be divided into breeding, juvenile and adult tanks.
- **Flat plastic bin:** This will serve as the media bed and will ideally be about 1x2 meters to allow accessibility to the crops.
- **Stand Pipe** (or Bell Siphon): This will help even out water levels within the system.
- **PVC Pipe:** A 7.5 cm diameter pipe will be sufficient to move water through the system. Additional pipes can be used to support the media bed to raise it above the ground.
- **Crops & Fish:** Tilapia and leafy greens are suggested and can be sourced from local markets.

### Optional:

- **Covering:** A mesh covering that allows sunlight to enter the system will be instrumental in protecting the crops from pests and animals.
- **Donkey:** This will provide heat for a year round aquaponic system to maintain water temperatures warm enough for the Tilapia to survive.

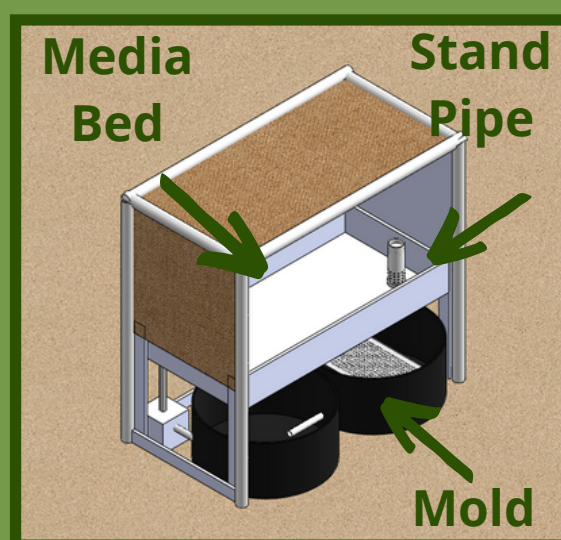
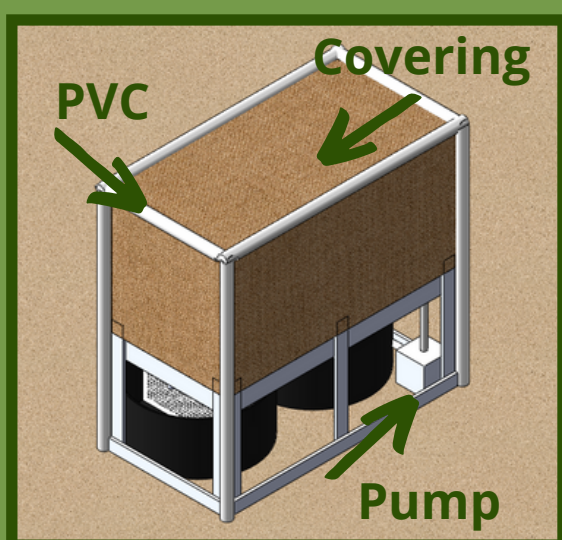
## Steps

- 1** Measure the perimeter of your grow bed and create a stand that holds the grow bed one meter above the ground
- 2** Affix the standpipe or bell siphon to the grow bed.
- 3** Take two plastic molds and connect them with a pipe in the center of each. Place them under the grow bed and divide the insides of the containers using mesh to separate a breeding station from a juvenile station.
- 4** Cut a hole in the side of the plastic mold and attach with PVC to the stand pipe/bell siphon.
- 5** Cut a hole in the side the mold facing the back of the stand to attach tubing. Then attach pump tubing to both the adult station and grow bed.
- 6** Construct a shade using two meter tall PVC for legs and extra PVC for crossbeams. Attach a material to shade the entire system that will let through light and keep out pests and animals.



## Post Construction

Congratulations! You have built your very own aquaponic system. After completing construction, it is essential that the water in the system be completely cycled for several weeks and ammonia is added. This is necessary prior to adding fish to your system to grow the bacteria colonies. Plants can then be added to the media bed in small growing pots that allow the roots to access the water. These pots can be held upright within the bed by filling the space with clay balls, lava rock, or even riverstone. To learn more about general aquaponic or hydroponic knowledge, please visit the corresponding fact sheets 1-3 provided on [www.thinknamibia.org.na](http://www.thinknamibia.org.na)



### References:

- BBC News. (2019, May 7). More than 500,000 at risk in drought-hit Namibia. Retrieved April 21, 2020, from <https://www.bbc.com/news/48185946>
- UNICEF. (2019). Drought Emergency Declared in Namibia. Retrieved April 21, 2020, from [https://www.unicef.org/appeals/files/UNICEF\\_Namibia\\_Humanitarian\\_SitRep\\_Drought\\_Emergency\\_9\\_May\\_2019.pdf](https://www.unicef.org/appeals/files/UNICEF_Namibia_Humanitarian_SitRep_Drought_Emergency_9_May_2019.pdf)
- Food and Agriculture Organization of the United Nations. (2020). GIEWS - Global Information and Early Warning System: Country Briefs. Retrieved April 21, 2020, from <http://www.fao.org/giews/countrybrief/country.jsp?code=NAM>

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