

## DRIP IRRIGATION SYSTEM

Sabana Grande, Nicaragua  
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### Background

- Grupo Fenix is a non-profit organization focused on using alternative energy in place of environmentally harmful practices
- Nicaragua's climate includes dry and rainy seasons that determine how Nicaraguans live
- Recent droughts have created distress about how they can live with less water
- Their traditional bucket watering techniques were about 40% efficient
- Drip irrigation is over 90% efficient

### Project Objective

- To maximize water usage efficiency in the garden to increase available drinking water

### Project Description

- Design and build a drip irrigation system to efficiently water the soil using less water
- Create a budget within cost range, but with long lasting sustainable materials

Table 1. Drip Irrigation Budget

Drip Irrigation		
Materials We Need	Cost	Our Cost
2 meters square metal	Already have	-
2 meters circular poles	Already have	-
2 meters angled poles	Already have	-
400 gallon tank	Already have	-
55 m 2 in pvc tubing	60 cords / 6 m	600 cords
160 m drip lines	260 cords / 100 yds	260 cords
(8) switch connectors	50 cords / piece	400 cords
(7) 3 way connectors	15 cords / piece	105 cords
(5) corner connectors	10 cords / piece	50 cords
(1) end pieces	15 cords / piece	15 cords
silicon	150 cords / tube	150 cords
<b>TOTAL</b>		<b>1580 cords</b>

- Soldering the tank structure was possible using leftover metal from another project
- The irrigation tank was higher than the drip lines on top of the structure, allowing for gravity to pressurize the system

### Project Description



Figure 1. Irrigation tank and stand

- Water flowed from the main tank to the irrigation tank and then to the PVC piping, creating a strong border for the garden



Figure 2. Irrigation drip lines in garden

- The soil was slowly soaked, keeping the soil moist throughout the day

### Project Description



Figure 3. Drip line water flow controllers

- The water flow was controlled throughout the day by on/off controls at each drip line

### Results & Recommendations

- The system succeeded in keeping the soil wet during the entire day using less water
- If modeled throughout the community, water efficiency can significantly increase drinking water availability

### Acknowledgements

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