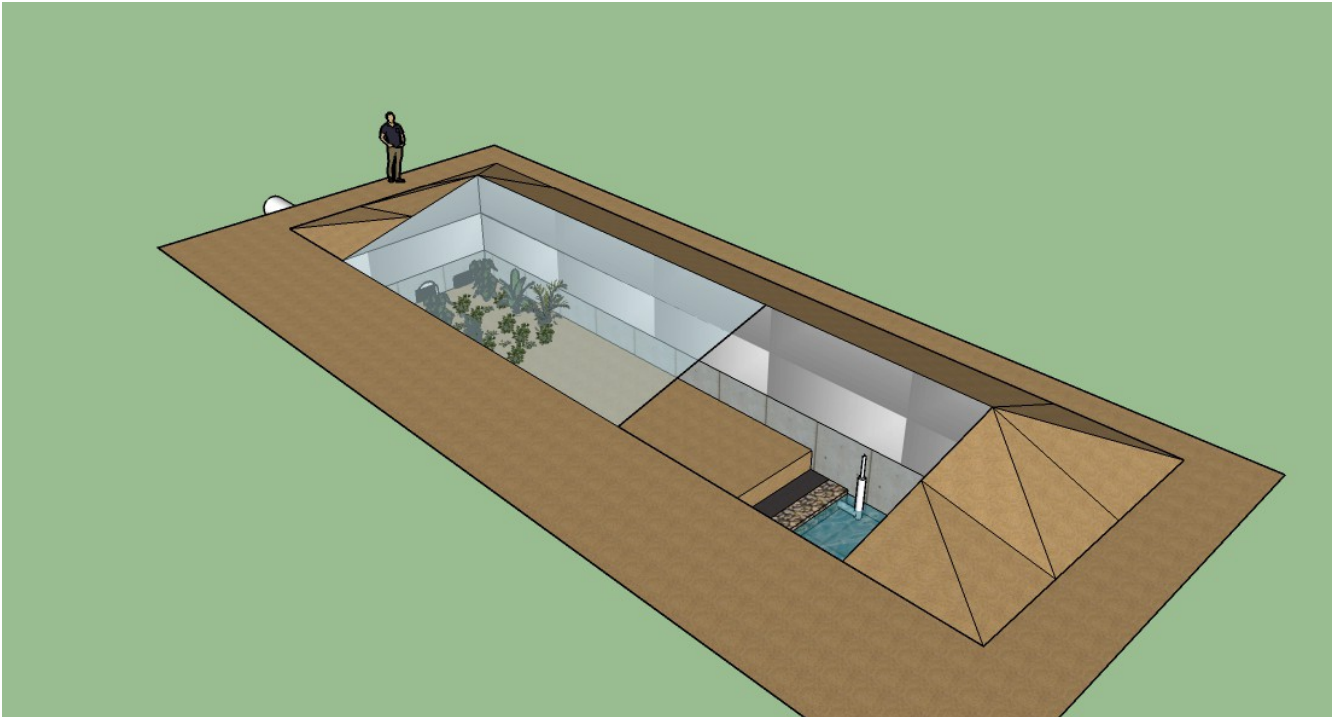


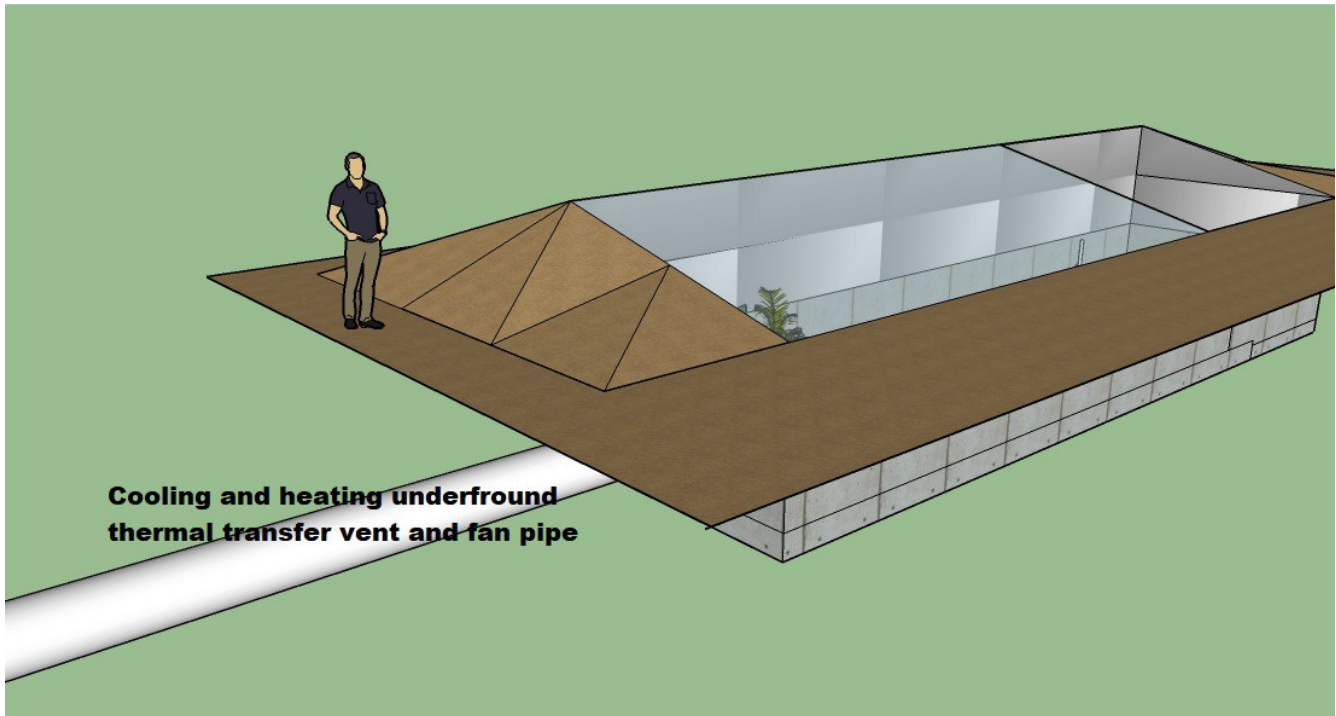
Water recycling underground year round greenhouse

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Far view of the underground thermal cooled and heated, water recycling greenhouse. Sun facing with a back wall, top hinged mirroring, able to raise to provide extra shade and reflect the sun, or reflect sunlight in the winter back on the plants. This greenhouse should provide food all year with one initial fill of water, that supply should last many growing seasons with minimal amounts of replacement. The loss is minimal from entering and exiting, and in the produce you carry out. A true solution to aired and dry climates around the globe, Inspired by the lack of water, and a changing environment with vanishing farms and lack of good solutions. This is a timely solution that's time has come.

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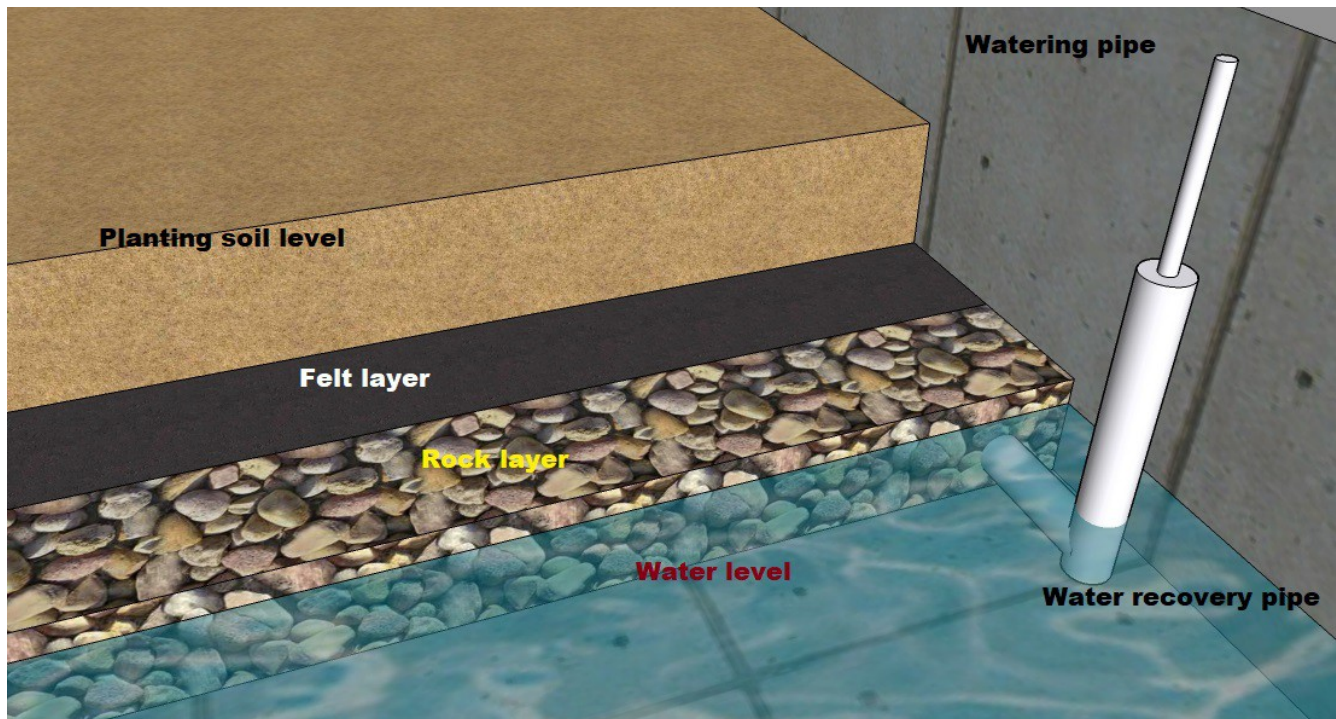


The underground pipe is installed below the frost line to gain thermal ground temperatures to provide heating and cooling air by the transfer of the ambient below surface temperatures. This same pipe is looped around the greenhouse and can be angled down behind the greenhouse where it enters a direct burial cistern, where condensation is collected and pumped back into the main subsurface tank. Because this cistern is also condensation recovery do to the cooler thermal temperatures, it may also be pumped back through another feed hose. This recovered condensation is distilled purified water.

The pipe then leaves the cistern and is looped around the other side of the greenhouse and angled back upwards where the thermal transferred air is blown back in by a fan. Both entrance and exit are near and above the water level in the direct burial cistern. Its level is maintained by using a pump located in the cistern, both reservoirs can be pumped using submerged DC pump's with piping and hoses.

Any good sealed sub surface pipe will do for the thermal transfer, like PVC, terracotta, galvanized covert. What ever is available in your area that is water tight and can be buried and sealed.

Not discussed here, is a distillate collection and recovery that can be applied for water purification where pond water can be brought in, and purified drinking water can be pumped out. That information is available on the website on first page.



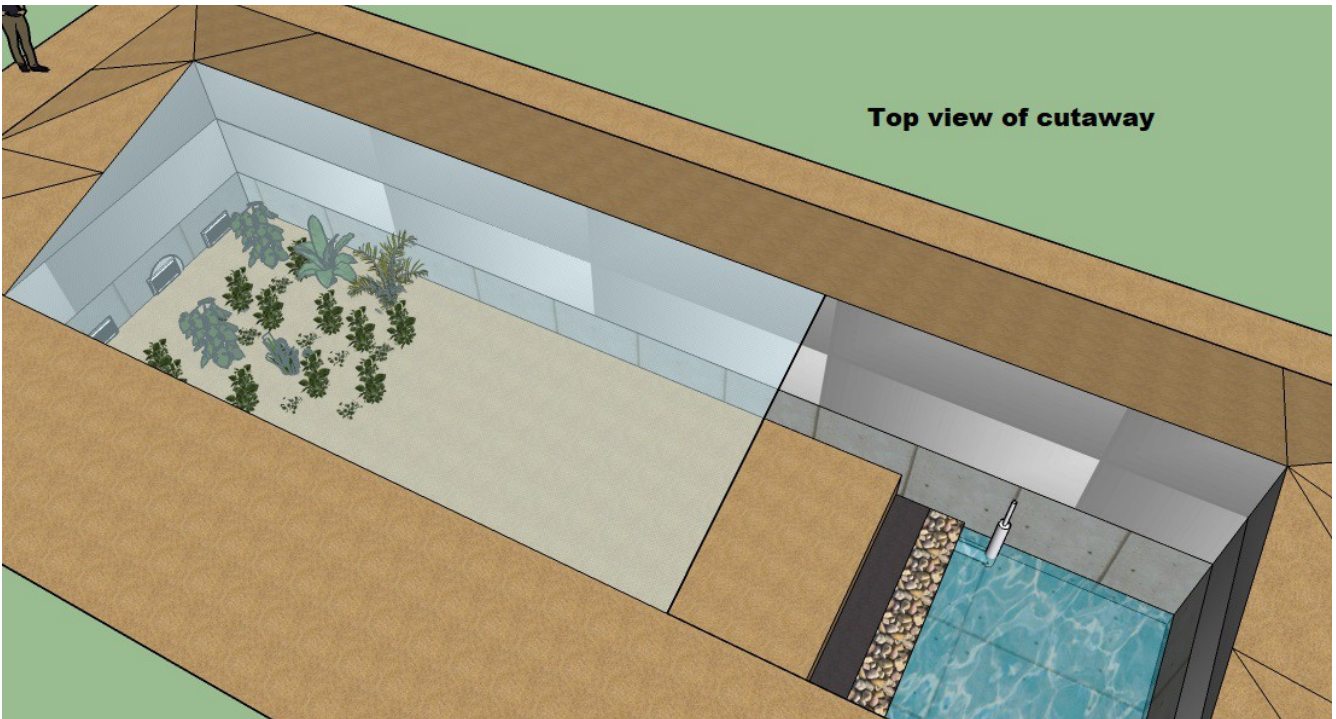
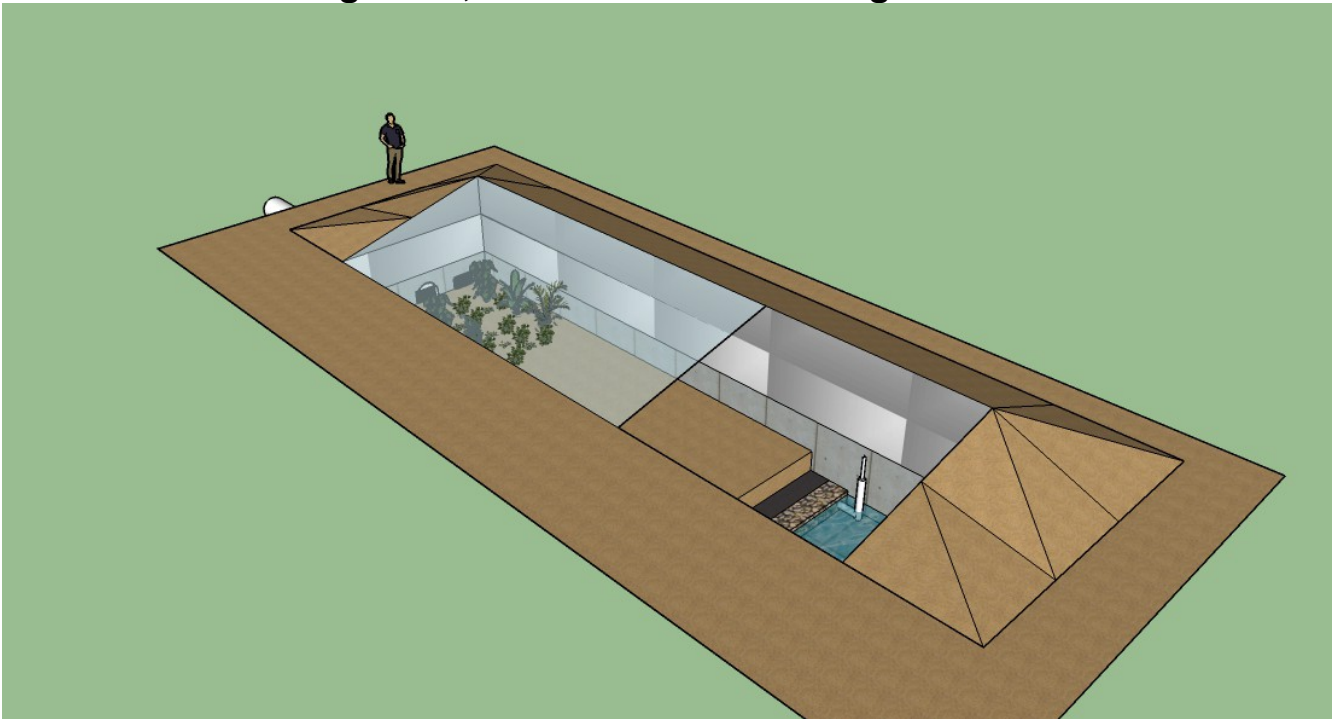
In this diagram, the concrete sealed underground greenhouse has a layer of gravel of 2 or 3 feet. A separate 4 inch pipe with hack sawed screen lines is installed in the corner to maintain a visible water level kept just below the gravel with a bottom cap to keep out the gravel.

Over the gravel is a double layer of felt to keep the soil from entering the water recovery in the gravel. A good layer of a few inches of sand on top of the felt will also act as a debris filter. On top of this is your growing soil. A few feet of good soil should do the trick. If your growing trees, like citrus and other more tropical varieties, the depth of the structure can be deeper and larger to accommodate your mini orchard, and garden. The angle of the cover should be adjusted to your region.

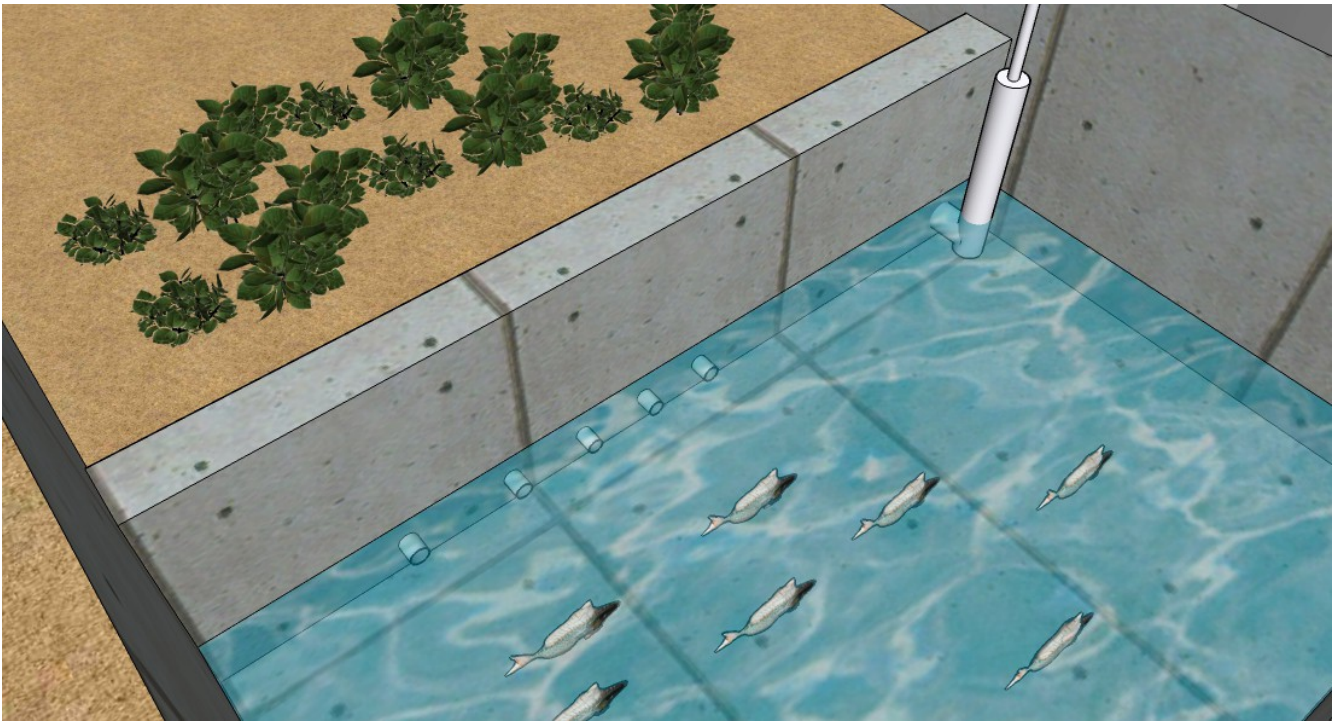
Remember, this is a sealed system, once filled with water, minimal water out. The humidity lost by entering and exiting, and the harvested plants you carry out is absolutely minimal at best. This is a fill it, and forget about it terrarium like system for dry areas where water is scarce at best. You can now grow a garden in the desert, and garden in the winter. And LED lighting can be added for short winter days to increase the production output.

In the rocky mountain west, the frost level is about 3 to 3.5 feet. Below this the thermal ambient temperature will keep your garden alive all year. A barrier wall could be added with small pipes allowing water to flow to a

fish pond where the cutaway water level is shown, this would provide nutrients to the garden, with out contaminating collected distillate.



A hatch and step ladder or a steps type entrance could be built on the side. With a tight seal, once filled with water to the level just below the gravel surface. A little rain collection off the surface maintain the level. Fill it once, and you have a year around garden watering source.



Fish pond added, note PVC pipe in barrier to allow flow, small water pump should be added to circulate fish pond water back into under garden supply. Also an aquarium type aeration pump should be added for the health of the fish. The depth of the pond itself could be increased well below where the fish pond is for added cooling and for cooler water species of fish, and increased numbers of fish. The plants will provide some food, or water plants could be added in the pond to help sustain them, and the fish provide all the necessary nutrients in the water from this method of recovery to the watering supply without contaminating the distillate collection area.