

HEALTHY FOODS MOVEMENT:

HOME FOOD PRODUCTION

FOOD PRESERVATION

FOOD SECURITY

via

INDOOR/ OUTDOOR MINIATURE FARMING

MODEL BASED ON QUAIL, FISH, VEGETABLES

& GRAIN AMARANTH

w/ Supplements on Home/ Business Security

and Third World Composting Toilets

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N.B. Some 2.5 billion people, of the world's 7 billion population, lack adequate sanitation, and therefore often pollute drinking water sources w/ human waste ..waste that causes diseases as well as parasite infestations preventing effective utilization of nutrients from various foods consumed. Thus, many Third World peoples find that adequate sanitation is a vital part of food security.

INTRODUCTION

In an era of increasing natural and human-caused disasters, some that could be prolonged, it is essential that more and more people gain the skills and means to grow enough foods to meet basic survival needs. This handbook seeks to teach such skills related to home food production and food preservation designed in a manner that individuals and families may achieve food security using their own means at home, work, or other available safe locations.

Now that more and more commercial foods contain hormones, antibiotics, pesticides and other harmful chemicals or GMOs, as well as useless additives, many more people seek to grow all or some of their foods by organic means. As an example of the food contamination problem, many foods now contain at least some GMO corn or GMO soy contaminated with glyphosate from Monsanto's herbicide known as Roundup. In several recent universities studies, lab animals fed a diet of GMO corn and/or GMO soy were found to have developed various cancers and sterility occurred. A similar result is anticipated for humans consuming significant amounts of glyphosate. (This is only one example of many hazards biotech companies are creating.)

According to United Nation's data, not less than 940 million of the world's 7 (seven) billion people now live on the brink of starvation. Many of these starving peoples live in or near the world's deserts (1/3rd of all land area). Global food shortages are being compounded by the fact that we are having more weather extremes for whatever reason, global warming or something else. With more droughts, flooding and violent weather events, fewer foods are being produced, harvested, and brought to market.

GMOs (genetically modified organisms/ crops) have been promoted as the means to help resolve many of the above said food production problems. In fact, GMOs have not produced this result, and the harmful chemicals used to help grow most GMO crops are causing harm to our air, water and soil. Biotech companies, like Monsanto, are placing "terminator" genes in their GMO seeds so that farmers cannot plant seeds saved since they will not grow. The farmers who grow such GMO crops must buy their GMO seeds each year at ever increasing prices.

If riots, martial law, insurgency or revolution events occur, in the U.S., as some expect, your food production efforts should not be obvious to others ... and you should not attempt to make your home or work place a fortress because that tends to attract the violent events you seek to avoid. For the same reason, you should not store your food reserves and other emergency items/ supplies in your basement or other obvious locations. Be creative and use clandestine means insofar as possible to prevent making you and your family a target for the "bad guys."

N.B. A good reference supporting information in this handbook is the "Urban Farming" book by Thomas J. Fox (Copyright 2011 by BowTie Press).

QUAIL REARING

To prepare for rearing quail, select a small 3 ft. x 3 ft. space in a garage, on a porch, in part of a closet, or the corner of a room. You will use this space for a 3-section breeding pen, with water and feed troughs, available from Quail Supply (www.quailsupply.com) for \$99.99 (..... Jan 2014 price); Item # 0303Q. Each section will hold 1 cock & 3 hens, so the total unit will rear 12 birds, and you may add more breeding pens as desired, and stack 3-high. When you place your pen order, also order a Pro Series Incubator to hatch 4 doz. Quail eggs using automated controls ... for a cost of \$139.99 (also Jan 2014 price); Item # F14200. It would also be helpful to order their book, entitled "Raising Bobwhite Quail" for \$4.99 (again, Jan 2014 price); Item # 9314Q. The instructions in this book are good for all breeds of quail.

The breed of quail I like to rear is the White Coturnix developed by Texas A&M University, and reared commercially by CM Game Birds (www.gamebirdfarm.net). This breed of quail has a high quality white meat and produces large eggs. They go from hatch to full maturity in 60 days, and typically weight 12 to 14 oz. per bird, with a 73 percent dress when slaughtered. Some hens should be retained to produce eggs for cooking, and for the next incubator hatch. To get you started, order 50 quail eggs (for this breed) from CM Game Birds, for \$90.00. Using the above said incubator, the hatch rate is usually 25 to 50 percent. This will provide you with the 12 birds you need to get started, with a few extra for sale or trade.

A usual incubation period, for these quail eggs, is 19 days. Before the hatch you need to locate, clean and sterilize a large tub or small stock tank for use as a brooder. Add 2 to 3 inches of ground corn cobs for litter, and purchase/ place a good heat lamp to provide the chicks with the needed warmth. The first 2 to 3 days, the cobs should be covered with a clean, heavy brown paper having no printing/ ink ... so the chicks do not confuse cobs for their feed. A small game bird feeder, for chicks, is needed and filled with a quality (organic if possible) game bird feed of not less than 24 percent protein. Watering (w/ spring water) the first few days should be accomplished in a fruit-jar lid with enough small marbles to keep chicks out of the water (quail chicks can and will drown themselves in even very shallow water.) Other basic guidance, on rearing quail, is fully provided in the above book you need to purchase.

If and when you expand your quail production, and produce enough birds to have a regular supply of quail meat, you may want to think about producing your own quail feed. If you grow the popping variety of Grain Amaranth, and pop this along with adding soybean meal for the

right amount of protein, you will have a good quail feed. Use organic production means for both these crops, and consult a Feeds & Feeding Handbook to get the right mix with a correct amount of protein. When your hens start laying eggs, provide them with some crushed oyster shell for extra calcium. In the event your quail develop a problem you cannot find a way to resolve, consult with your local USDA County Extension Agent or nearby veterinarian. Add your quail manure to a garden compost drum or use for nutrients if your grow algae as suggested herein. (How to best process your quail will be covered under food preservation, in a following section).

Organic quail eggs have a fantastic taste, and although you need more than the usual number of eggs for a recipe, the extra time required is well worth the effort. If you are saving eggs to hatch, they must not get too hot, too cold, or too dry and must be turned on a daily basis. The above said incubator provides the right temperature and humidity, as well as turning the eggs on just the right schedule (except for the fact that the eggs are not turned the last 2 days they are in the incubator).

In the event of a threat from bird flu, or bird flu epidemic, keep all other birds (including wild birds) away from your quail. If a known biohazard exists, a special cover and air-filtration system may be needed to protect your quail. Upon discovery of such a threat, USDA (the U.S. Dept. of Agriculture) and DHS (the U.S. Dept. of Homeland Security) should be providing public instruction on protection against biosecurity and/or bioterrorism threats.

FISH

(Aquaculture/ Algalculture)

Any one of several 60 gal. to 120 gal. aquaculture tanks, w/ biofilters to eliminate manure and ammonia problems while aerating the water, will rear 8 to 16 Tilapia fish from small fingerlings to fillet-size in about 10 to 11 months. Tilapia are fast growing, great tasting and easy to rear. They are algae eaters, so part of their feed may be the algae you grow for yourself (as I will explain below). These fish will also consume garden scraps, and a good supplemental feed is popped Grain Amaranth (as produced via the instructions provided herein). Your fish tank may be located anywhere it does not get too cold. Tilapia will die when their water temperature falls to 55 degrees F or below. These fish require a significant amount of oxygen, so you may want to use a small air-pump with connected tube, and air-stone attached to the other end to be placed in the aquaculture tank. Make certain your tank has a lid/ cover since Tilapia will jump out if given the opportunity. (A seed sprouting tray makes a good lid, and gives you the option of sprouting your own seeds.)

For my aquaculture unit, I like to use a Aqua Eco-Systems conical-bottom tank that allows me to add plumbing, plus a W.W. Grainger cycle-timer and solenoid valve, to flush the ammonia and fish manure from the tank (for 2 minutes of each hour). The “fertigation water” (fish water & fish manure provided) will irrigate and provide nutrients to a raised-bed garden, regular garden, vertical garden or fruit trees in your yard. I will typically use 1/2 inch PVC Schedule 40 pipe to move the water to where it is needed and drill 1/4 inch holes, every 8 inches, where crops are grown. In the case of vertical gardens, I deliver this water to a tub or tank where I fill an elevated tank provides water to drip-lines used to water these gardens (details in the next section). On a test model, an elevated raised-bed garden was used with surplus water being drained out the bottom on one end where a bulkhead fitting and PVC pipe delivered this water to a tub. A 1/3 HP sump-pump, w/ automated controls, pumped the water to an algae tank where algae was being grown for my Tilapia fish. Despite the use of a good water filter, some soil microbes (from the grow-bed) were transferred to the algae tank where they formed a heavy biofilm on the inside of the tank. This biofilm greatly slowed algal growth, so I do not suggest this practice even though it acts to recycle system water.

Cost and benefit analysis should be used to determine if you want to use a standard biofilter system, or use the above suggested periodic flushing technique to solve the ammonia & manure problem for your fish tank. Either option is somewhat expensive and may cost over \$650.00. The flushing technique will provide you with plant nutrients that you might otherwise need to purchase. A single cycle-timer, solenoid valve and PVC plumbing system may be designed to support the operations of several aquaculture tanks, so the cost on a per fish basis will be reduced if and when an aquaculture operation is expanded. The secret to cost-effective home aquaculture is user system innovation(s).

In the case of Tilapia or other algae-eating fish, algaculture (algae production) will help to reduce feed costs and produce fish with higher levels of desirable Omega-3 lipids. In addition, water and algae may be easily pumped (using a automated 1/3 HP sump-pump) into the fish tank to replace the “fertigation water” removed each hour. A Aqua Eco-Systems FT811 tub, or similar tub or tank is used to hold about 60 gal. of water to grow the algae in. Algal seed stock may be purchased from Carolina Biological, Aquatic Eco-Systems, and The University of Texas/UTEX Algae Collection ... and I generally grow a *Scenedesmus* freshwater algae. Spring water should be used if at all possible. If you are forced to use city water with all the chemicals added, fill an open-top tub and add a 100-milligram tablet of vitamin C for each 10 gal. of water and aerate for 24 hours. A small air-pump will be needed to pump air via a air-tube to an air-stone (placed in the tank) at the end of the tube. Air also delivers the CO₂ for use by algae in obtaining the carbon it needs (about 40 percent of its nutrient requirement). To provide the other nutrients needed (primarily N, P, & K), collect reasonably fresh quail manure (from your quail), and place this in a stainless steel screen device that may be lowered into tank water in a

manner that retains/ holds manure solids. To speed algal growth, also add 3 or 4 drops of liquid fish emulsion daily. (Algae will typically double itself on a daily basis, so it does not take long to produce a great deal of algae.) Add fresh water daily to replace that pumped to the fish tank along with part of your algal crop.

Keep in mind that some algae may also be harvested as a food supplement. Algae are high in vitamins, minerals, protein and polyphenolics (needed to enhance immune system response). The Aztec and Inca populations, as well as 17 different tribes, harvested algae to blend with soups ... and sun-dried algae to blend with cereal grains used to make bread flour.

To obtain the Tilapia fingerlings you need, contact your state Dept. of Fish & Game to locate commercial breeders who sell these fingerlings. Tilapia Farming at Home (www.tilapiafarmingathome.com) also has suggestions on getting started in this form of aquaponics. "Tilapia Fish Farming: Practical Manual" is available from www.amazon.com. If you decide to expand your operation, with 5 adult females and 1 adult male you may start your own breeder colony. Such a colony often looks like a Japanese water garden with gravel, rocks and plants in rather small, somewhat shallow water ponds. If you need to purchase Tilapia food (feed), a good source is aquaponicsusa.com. With an extra tub of spring water and some fresh quail manure, it is also possible to grow a significant amount of Duckweed to supplement the algae grown to feed Tilapia. (Most large aquarium retailers have Duckweed seed stock ... or order from Mangroves & More.)

No matter what type of tank water filtration system you use (mechanical, biological, or chemical), it is essential to understand what it is, how it works and what is required for proper maintenance. (For biological systems, good bacteria are used to convert ammonia to nitrite and then nitrate ... with the nitrate being beneficial to fish.) See the article on eHow entitled "How Does an Aquarium Filtration System Work?"

Tilapia are considered the best breed of fish for home food production, but they are not the only breed of fish available for this purpose. Do your research, and decide what fish breed you wish to rear. Even carp and Koi are an option if they are cooked in a pressure cooker to turn their many small bones into a gel. In many areas of the world, fresh Tilapia are cooked with very little preparation time ... they are often just gutted, wrapped in foil and placed on hot coals from a recent fire or charcoal burn. Other options for cooking and preservation will be covered under the food preservation section.

Although small-scale, home production of Tilapia is somewhat expensive to start, keep in mind that expansion of this food production system is easy once you learn the basic aquaculture techniques needed. The value of having your own safe, fresh and immediately available food supply cannot be underestimated.

VERTICAL GARDENING

(Aquaponics & Biochar)

For home food production it is assumed that most people will have very limited space inside or outside their residence, so a vertical garden is the best option for the most crop yield per sq. ft. In many areas, you also may also want your home food production not to be easily visible to any potential rioters/ looters during an emergency.

The suggested vertical garden starts w/ 3 each 10" dia. sections of Schedule 40 PVC perforated pipe, with each section 6 ft. in length. This pipe needs to be NSF Standard 61 for use with water and food systems. Holes are 7/8" w/ 2 rows of holes on opposite sides, each hole being 6" apart center to center. You may purchase from National Pipe (www.nationalpipe.com), or other PVC pipe suppliers. If this pipe only comes in 20 ft. lengths, have it cut so you will have the three 6 ft. lengths needed plus an extra 2 ft. length for use as outlined below.

Locate a spot for your garden where, if possible, there will be not less than 6 hours of full sunlight each day, for either inside or outside locations. If your location lacks that amount of sunlight, you may need to use full-spectrum grow-lights to get enough light for your plants to grow as they should. (In the past, I tried to add sunlight tubes for indoor sunlight, but the light provided is not adequate to grow plants.) Find or purchase a shallow tank/ tub (10" to 12" of sidewall x 4 ft. to 5 ft. dia.) and arrange/ place the above three PVC 6 ft. long pipes in a triangle arrangement ... with bottom ends in the tank/ tub. Attach heavy bungee-cords at the top to hold pipes vertical until a top-platform is fixed to prevent pipes from falling (.... see drawing).

Fill the above tank/ tub with a mix of coarse sand, very small pea-gravel, to a depth of 8 inches, to fill the space around the vertical pipes. Before completing this fill, add a 3/4" PVC bulkhead fitting, to the sidewall within 1 inch of the top, and attach 3/4" PVC pipe extended to a grow-bed, flower-bed, fruit trees, lawn, edible landscape or location where you wish to utilize water runoff from your vertical garden. (In a prior experiment, I tried to use this surplus water for algal production, but this water makes an algalculture tank too murky even after the water is filtered using a good quality water filter.)

Once the above said PVC pipe is secured in the sand-pea-gravel base, add a Rainbird Gardener's Drip Kit (www.rainbird.com) so that you have a drip line located near the center of each pipe ... w/ drip holes every 6" to 8" from top to bottom. To provide a constant supply of drip-water, by means of gravity flow, purchase a 10 gal. or 12 gal. water tank from the Tank Depot (www.tank-depot.com), or other supplier of tanks approved for safe water/ food systems. Provide a secure platform on top of the three vertical PVC pipes, and use the platform to lock the pipes in place while holding the water tank attached to drip lines for a constant supply of drip-water for crops.

Before you firmly attach the platform top to vertical PVC pipes, add your soil mix to fill each pipe. To keep the mix from spilling out the perforation holes, use patches of fine steel wool stretched to provide root and shoot exits when you later plant seeds inside the steel wool ... with the edges of the wool patches behind the edges of each hole. The soil mix that seems to work best consists of the following: 1) Course sand ... 20 percent; 2) Very small pea-gravel ... 10 percent; 3) Spagnum peat moss ... 10 percent; 4) Organic compost ... 30 percent; 5) Perlite ... 10 percent; 6) Good topsoil (for soil microbes) ... 10 percent; plus 7) Bioactivated biochar ... 10 percent. Biochar generally acts to double typical crop yields.

To help you successfully operate your garden, obtain a copy of "Organic Vegetable Producers Guide" and "Pocket Guide to Vegetable Diseases" ... both available from the AgriLife book store (www.agrilifebookstore.org). Also obtain a copy of "Life in the Soil," by James B. Nardi, and "The Biochar Revolution," by Paul Taylor, Ph.D. It will also be helpful to have a copy of "Natural Sources of Plant Nutrients," by Eric Sideman, Ph.D. You will need an open top tank holding 20 gal. to 30 gal. of source water (at floor/ ground level), that is pumped to fill your elevated tank every 2 to 4 days ... to provide water for your drip system. Use only well or spring water free of chemicals, or if you must use city water (w/ chemicals) allow it to stand 24 to 36 hours so most of the chemicals will evaporate. To your source water tank/ tub, add the correct amounts of N,P, K and other needed organic nutrients according to the best hydroponics nutrient formula.

Johnny's Selected Seeds, or other suppliers of organic (non-GMO) seeds should be used to order the seeds needed for starting your vertical garden. Most people will want to plant 4 or 5 herbs, 7 or 8 greens, and a wide assortment of vegetables. I suggest using biodegradable grow-packs with a starter mix to first germinate your seeds in a tray. Water as needed, and when the seeds germinate (with obvious shoots and roots started), it is time to bed the trays, one-by-one, in the rockwool patches placed just inside the perforated holes in your vertical garden. Larger plants that will need support, should be planted toward the inside of the triangle-shaped opening between your three garden tubes. This arrangement allows for trellis supports to be placed between the tubes to support crops such as tomatoes. (More space between the tubes may be created by using a larger diameter tank/ tub for the vertical garden base.) If you have a 2 ft. section of the 10" dia. PVC left, in the event you cut 3 each 6 ft. sections from a 20 ft. pipe, place the 2 ft. section in the center of the triangle between the pipes (add the soil mix, plus another drip line) for planting Grain Amaranth (this crop needs vertical growth, so seeds should be planted only in the open, top-end of the pipe). If you are growing Amaranth to feed several quail, also add a typical grow-bed section for a larger crop of this cereal grain. Use a rotating schedule for planting and harvesting to increase crop yields.

Agricultural research in not less than 7 nations has established that bioactivated biochar will generally double typical crop yields when added to garden soils at a rate of 8 to 10 percent

biochar. Gardeners may make their own biochar by using a 30 gal. steel drum to make an internal pyrolysis unit to make biochar from wood ... if placed inside a 60 gal steel recovery drum where a wood fire is used to provide heat for pyrolysis. The pyrolysis unit has an open top that is placed upside down in the outer drum ... or it may have a sealed lid if there are a few holes around the bottom of the pyrolysis drum so the syngas produced from pyrolysis may escape and burn inside the outer drum. Once the fuel in the outer drum is started, a top is sealed on this drum and a stove pipe is placed over/ on a pre-cut hole to help pull air inside this outer drum via a few holes drilled along the bottom of this drum. An instructional video on this "Making Biochar" techniques was prepared by Peter Hirst, and is available on You Tube (www.youtube.com/watch?v=RXMUmy8PpU).

To bioactivate biochar, soak in a tank/ tub filled with a mix of crushed biochar, water, organic compost, quality topsoil, and algae grown in mineral-rich water (some practitioners also add a cup of sugar and/or cup of yogurt ... but the benefits of same are not confirmed). At the end of a two-week soaking, mix the biochar with your soil mix or garden soil(s) at a rate of 8 to 10 percent (I am suggesting the 10 percent rate for vertical gardens).

The nutrient benefits of growing and consuming organic crops have been proven by university research. At the University of California, Davis, researchers recently determined that crops grown by organic means usually have 58 percent more polyphenolics (needed to help improve immune response). This is yet another reason, in addition to all my other reasons, for individuals and families to be engaged in home gardening.

FOOD PRESERVATION & FOOD SECURITY

As is well known and documented, home food preservation may occur by: 1) Water-bath canning; 2) Pressure canning; 3) Freezing; 4) Drying; 5) Fermentation; 6) Pickling; and 7) Curing. See "Canning & Preservation for Dummies," 2nd Edition, by Amelia Jeanroy & Karen Ward. Also consult with the Natl. Center for Home Food Preservation (nchfp.uga.edu).

A new innovation for food preservation in developing areas is my solar-zeolite refrigerator & freezer that facilitate keeping food fresh in areas with no power. The initial prototype for this invention is shown on the website for my charity, NPI (www.needfulprovision.org). Added work is being undertaken to manufacturing this food preservation means for impoverished peoples with few available means to preserve perishable foods.

For most users of subject food production means, they will quickly prepare and consume most of the foods produced, so food preservation only becomes important once they expand home food production capacity.

As indicated in the Introduction, food security has become a global problem with 920 million people living on the brink-of-starvation and increased natural as well as human-caused disaster acting to lower food production. A number of food supply experts and international agencies are predicting grain shortages on a global basis, even in the U.S. Many concerned governments are attempting to stockpile grain reserves knowing that food shortages often create rioting on a large scale. If the food trucks stop moving in the U.S., for any reason, the shelves in grocery stores would soon be empty and food riots are anticipated (in this event) in 2 to 3 weeks. One bioterrorist event in the U.S. could kill a majority of our crops and/or livestock. Extreme water shortages are occurring, worldwide, and there is less water to irrigate crops. Desertification and deforestation are expanding. The harmful chemicals used to grow GMO crops are very damaging to our water and soils. In brief, food security is becoming more and more difficult to achieve.

Given the above situation, every opportunity should be used to improve and expand home food production. In addition to the food production techniques presented herein, individuals and families should consider using part of their yard for edible landscaping & square foot gardening in raised-beds (www.squarefootgardening.org). Also consider developing a "Backyard Homestead" along the lines being promoted by Organic Gardening. Perfect your techniques for increasing crop production using improved nutrient management (see the "Guide to Symptoms of Plant Nutrient Deficiencies" ag.arizona.edu). Also improve your pest control methods using natural and/or organic means (see www.arbico-organics.com).

On a global basis, it will take more than home food production to provide food security for the world's 7 billion people (with numbers increasing daily). My charity, NPI, has developed innovative new technologies to support counterdesertification efforts to start food production on desert lands, worldwide (1/3rd of all lands). See <http://www.needfulprovision.org/articles/counterdesertification.php>. To help slow deforestation for green energy crops, such as palm oil, NPI has also developed new technologies for green energy production. See <http://www.needfulprovision.org/articles/the-greening-of-energy.php>. To truly achieve food security on a global scale a massive effort will be needed.

HOME/ BUSINESS SECURITY

The dramatic increase in fires, floods, tornadoes, hurricanes, criminal activities and terrorist threats is causing ever escalating losses of homes and businesses in the U.S. and overseas. In the event of food riots, revolution and/or insurgency, such losses would be greatly increased. With over 70 armed Patriot and neo-Nazi groups (in the U.S.) intent on eventually attacking and overthrowing our government, we cannot be certain that some form of revolution is not in our future. Moreover, our government has allowed significant numbers of trained & experienced al-Qaeda terrorists to enter the U.S. as refugees. If intelligence reporting is correct, Iran is now

paying Mexican drug cartels to help smuggle military weapons into the U.S. for use by these terrorists. It would be naïve for us to assume that there will be no future threats to our homes and businesses. In a single fire in 2013, in Colorado, over 400 homes were lost to fire. When you count the other home/ business losses, from assorted disasters, the loss is great.

In the U.S., and throughout the world, people are responding to the above threats and the fear of social chaos by building their new home underground ... and making these homes totally self-sufficient as well as off-the-grid. Real Goods, a company that sells alternative energy systems, composting toilets and other self-sufficiency items, reports that in 2013 over 100,000 new self-sufficiency homes were constructed in the U.S. These homes typically are underground or partly underground, with advanced security systems having locations generally free of usual threats such as floods. All these homes, as well as similar new businesses, generally have alternative power such as photovoltaic systems, solar hot water, composting toilets, greywater recycling means, sunlight tubes (for natural lighting), protected greenhouses (for home food production), edible landscaping and other features contributing to both security and self-sufficiency. Such homes/ businesses are not inexpensive to create, but over the long-term most are very cost effective. The big advantage is that these structures will improve individual and family survival in all types of potential disasters.

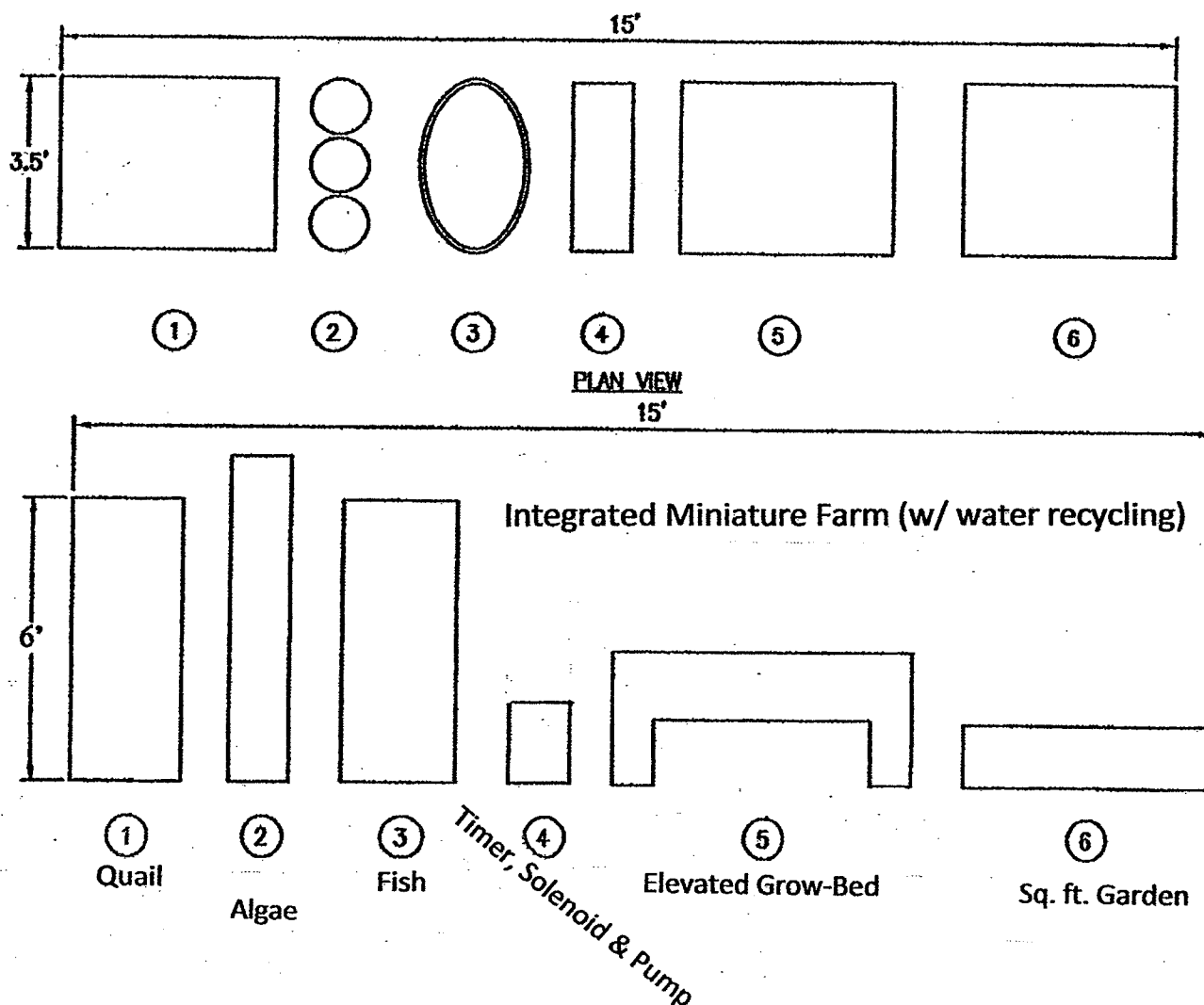
The drawings section of this handbook will show a self-sufficient earth sheltered home my charity, NPI, is planning to construct and test. Design of this home was by Earth Sheltered Technology, Inc. of Mankato, MN. If you elect to build such a home, you will need an architect or engineer familiar with such construction, and a company skilled in building these homes. Due to one side of our model home being exposed (not earth-sheltered) we will use Lexan bullet-proof clear coverings over windows ... and the doors/ door frames and garage door will be made of extra heavy steel. We plan to make the garage space into an indoor garden using grow-lights and the other techniques detailed in this handbook.

A problem with obvious self-sufficient and earth sheltered structures is that they may look like lucrative targets for rioters or looters. For this reason, such structures are best located in rural or remote areas. If located in an urban area, these structures need to blend with surroundings or be hidden behind natural hedges (if they are allowed). If sheltering-in-place may not be a safe option, have a good 72 Hour Emergency Preparedness kit and evacuate to a secure area. On my charity's website (www.needfulprovision.org), you find added safety information under the following topics: 1) Volunteer Safety & Survival; 2) Homeland Security Checklist; and 3) Emergency Preparedness Alert. Your ability to survive is your ultimate security. For an example of how security may be achieved in an insurgency situation, see the "Buon Enao Experiment ... JP Harris," as posted on Google. (Buon Enao was one of my early security projects.)

PROJECT DRAWINGS

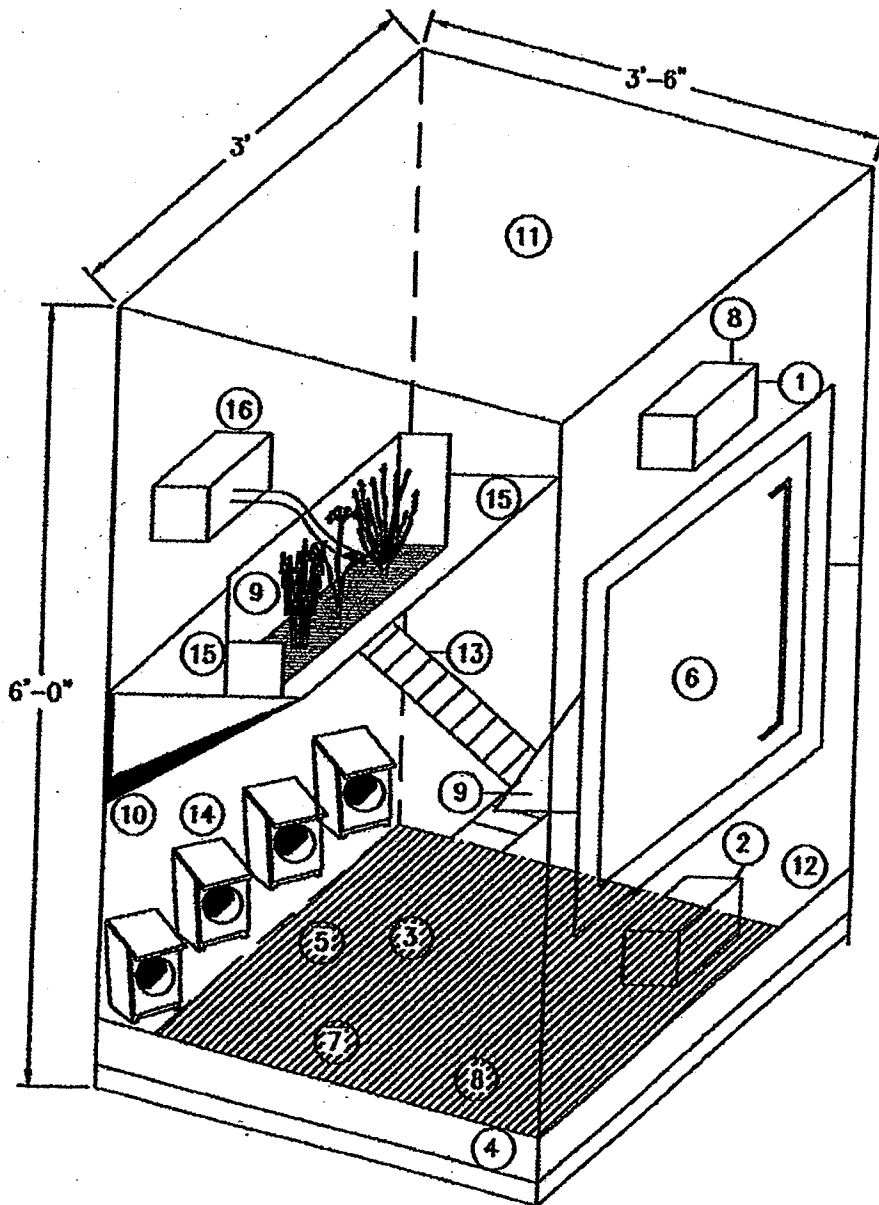
The drawing that follow are of food production systems, discussed herein, as designed, developed and tested by the author (David A. Nuttle) and his research assistant, Linda C. Ehrlich, Ph.D. and the staff of Needful Provision, Inc. (NPI) ... the 501(c)(3) charity that Nuttle founded in 1995, and directs as President. Drawings of the self-sufficiency, earth sheltered house shown is an exception to the above since NPI construction and testing are pending rather than complete.

A fully integrated food production system, with quail, algae, fish, vegetables and grain Amaranth was tested with automated water recycling incorporated into the system. As noted heretofore, we have not recommended this system because soil microbes (in the soil around plants) are transferred to the algae tank where they form a biofilm on the inside tank wall that acts to impede algal growth. At this writing, this problem has not been resolved. The original design was based on the author's "Hydroculture" system (Nuttle's U.S. Patent No. 5,121,708). To see a video on this model Google search for David Nuttle, and view David Nuttle: Innovative Food Production – You Tube.



Biosecure Quail/ Dove Habitat for Areas w/ Bird Flu

(A simplified, unsealed version used for areas w/ no bird flu hazard)

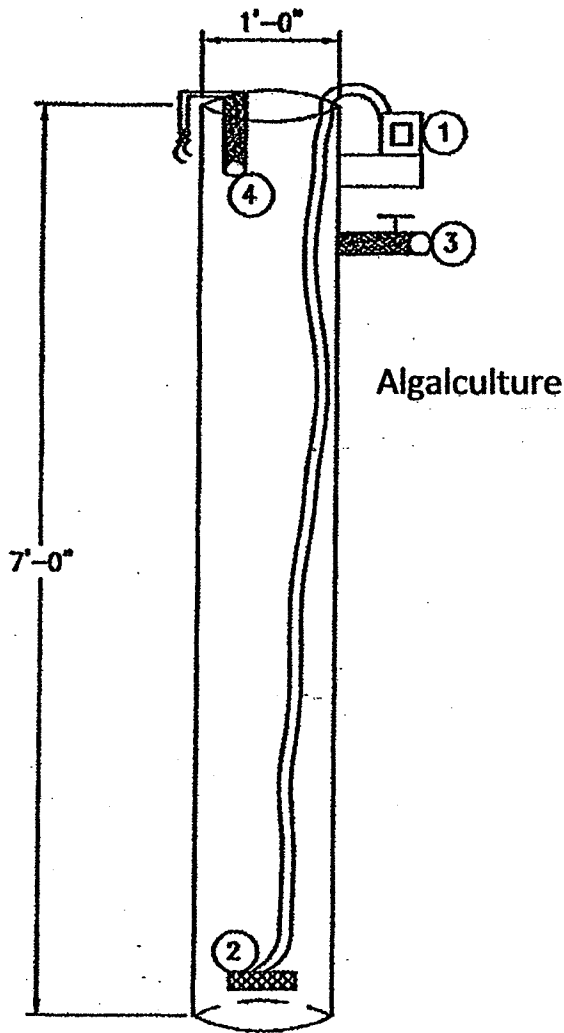


LEGEND

- ① Air Filter (In)
- ② Air Filter (Out)
- ③ Wire Floor
- ④ 2 Manure Trays
- ⑤ Roost
- ⑥ Door W/ Seal
- ⑦ Feed
- ⑧ Water
- ⑨ Plant Shelf
- ⑩ Support
- ⑪ Top
- ⑫ Incubator/Brooder Corner Area
- ⑬ Ladder
- ⑭ Nesting Box
- ⑮ Planter Box
- ⑯ Water Tank With Drip Line

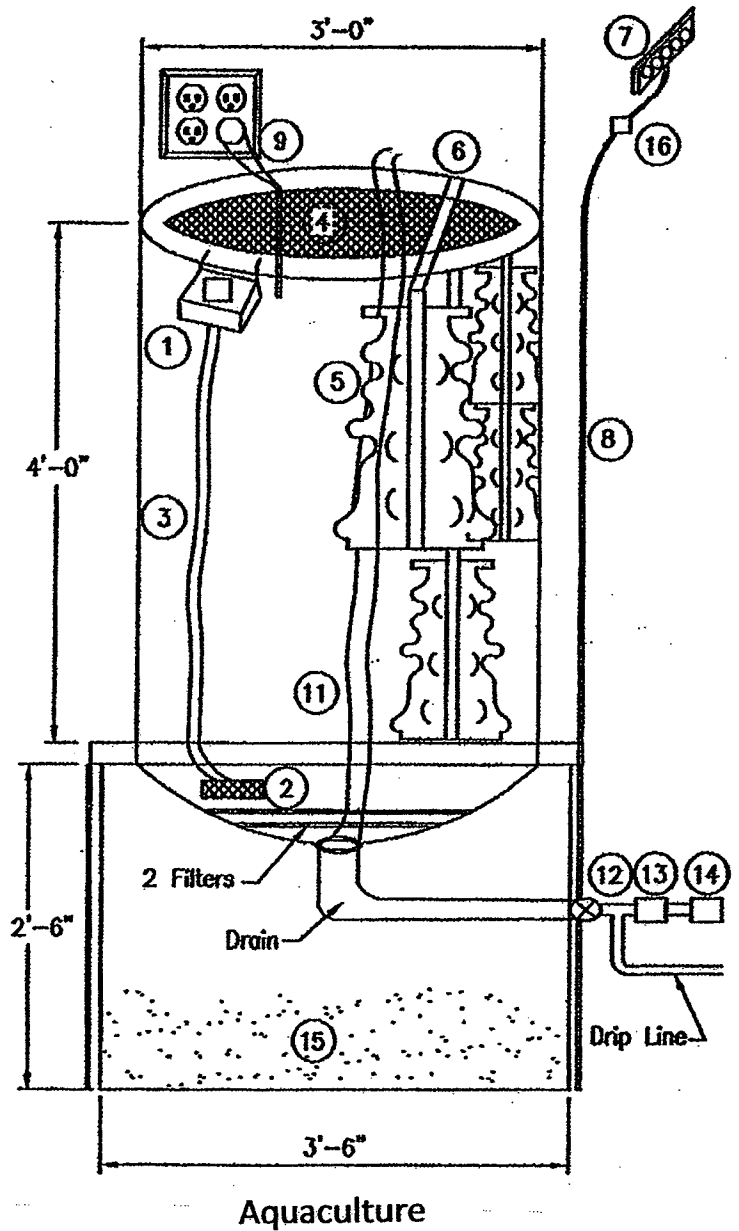
Notes:

* Manure Trays have seals. When top tray is removed for cleaning, bottom tray takes over.

LEGEND

- ① Aerator on Platform
- ② Airstone Connected by Tube
- ③ Drain/Top to Remove Algae w/ Water
- ④ Filter Tube for Manure Sock

- ① Aerator
- ② Airstone
- ③ Air Tube
- ④ Screen Over Top
- ⑤ Artificial Kelp
- ⑥ Support To Hold Kelp
- ⑦ Grow Light
- ⑧ Support For Grow Light
- ⑨ Water Tank Heater
- ⑩ 1" PVC Pipe W/ Valve & Solenoid
- ⑪ Pull Device to Remove Filters for Cleaning
- ⑫ Ball Valve
- ⑬ Timer
- ⑭ Solenoid (to control water flow)
- ⑮ Biological Heater
- ⑯ Light Timer

LEGEND

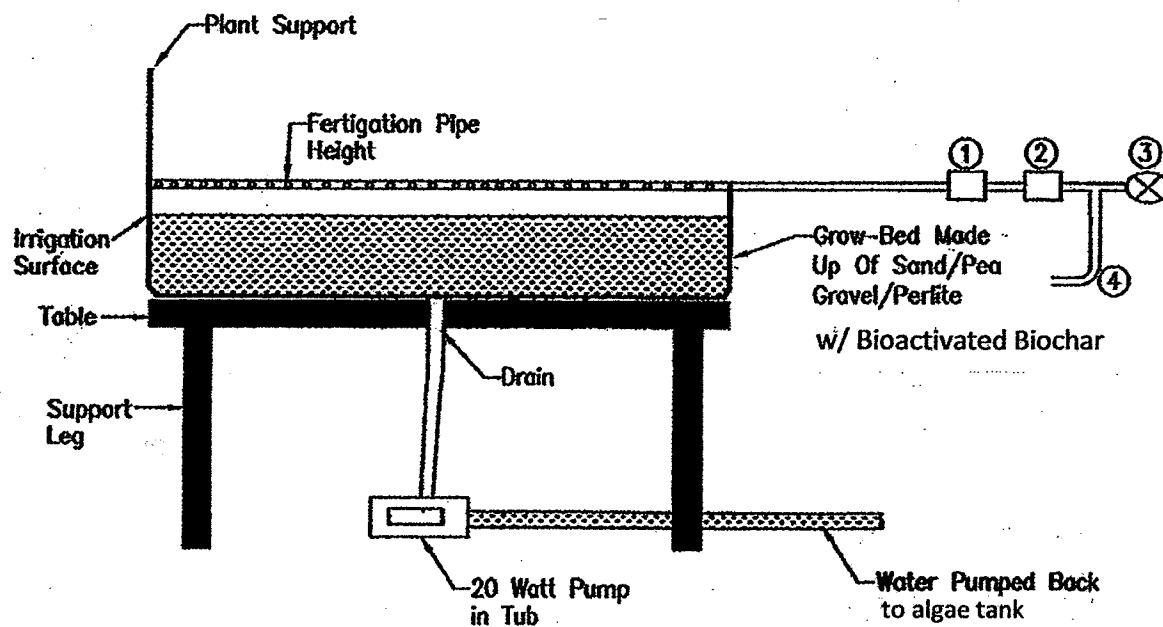
Aquaculture

Elevated Grow-Bed

Use the same soil mix for vertical gardens, or use the mix shown below if recycling water. It may be helpful to add bioactivated biochar to the latter mix, but the algaculture tank may need to be cleaned to prevent biofilm growth on the inside tank wall(s).

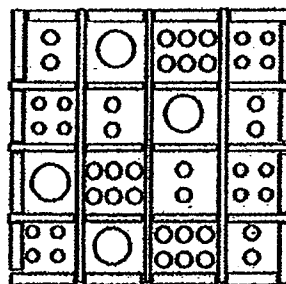
N.B. Start your crops w/ seeds, started seeds in biodegradable containers, and/or the stalk base/ bottom of organic onion, celery & other vegetables that will root if stalk-bottoms are placed in water ... and exposed to not less than 6 hours of sunlight daily.

Aquaponics



LEGEND

- ① Solenoid
- ② Timer
- ③ Ball Valve
- ④ Drip Irrigation Line



Sq. Ft. Garden

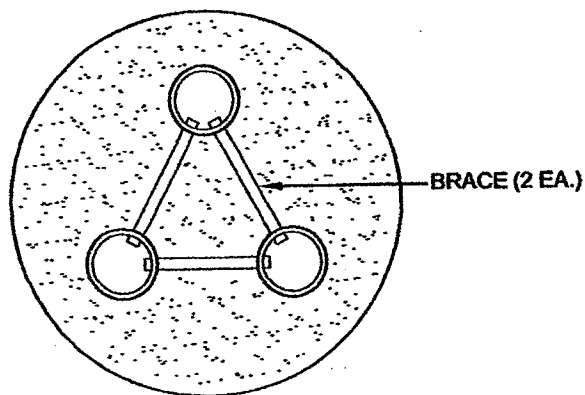
**TYPICAL DRIP GARDEN
PLANTING LAYOUT**
(Each Square Used For
Different Veggies)

VERTICAL GARDENING

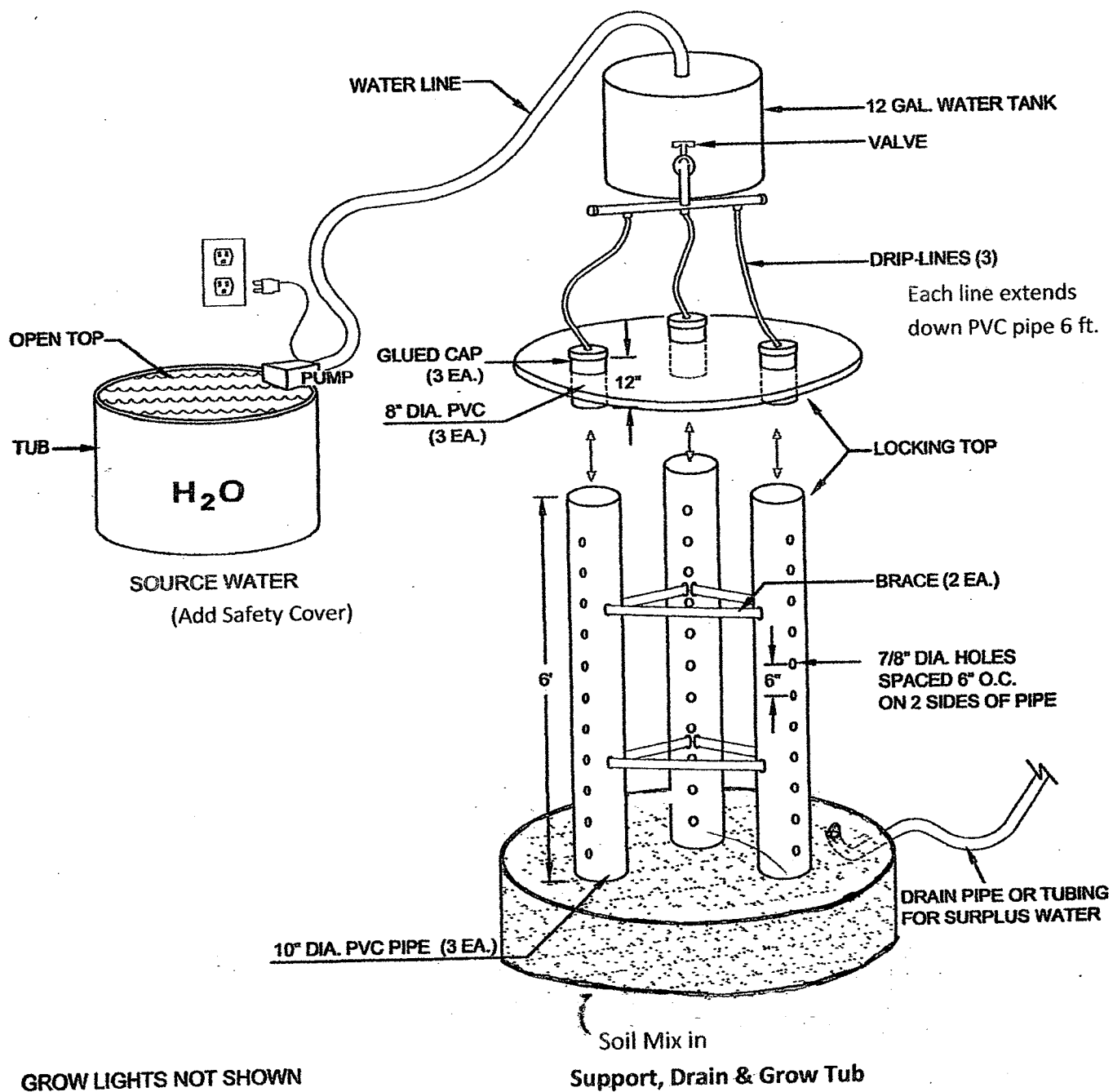
INDOOR / OUTDOOR USE

DESIGN BY DAVID A. NUTTLE

TOP VIEW

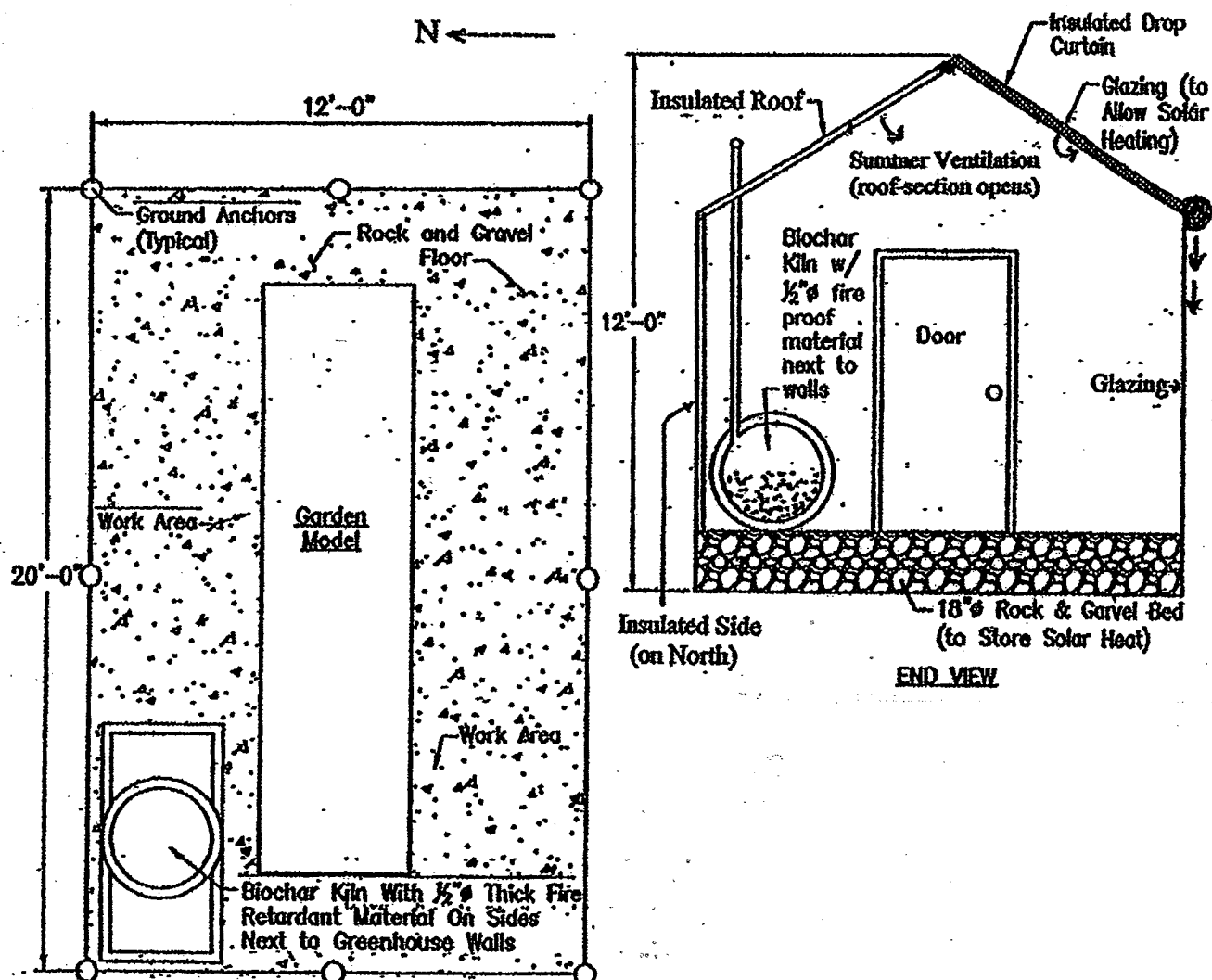


Not To Scale



Small, Insulated Greenhouse for Home Food Production

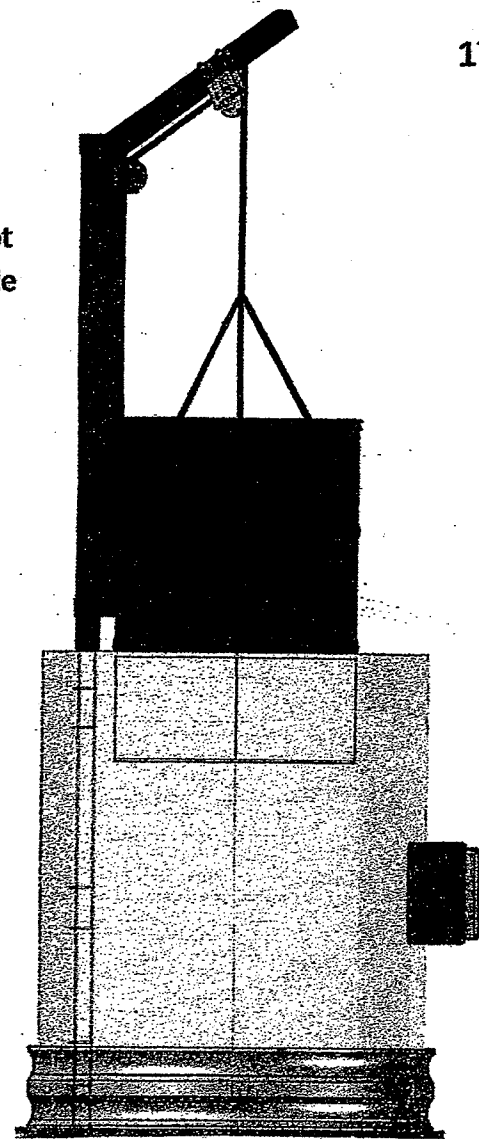
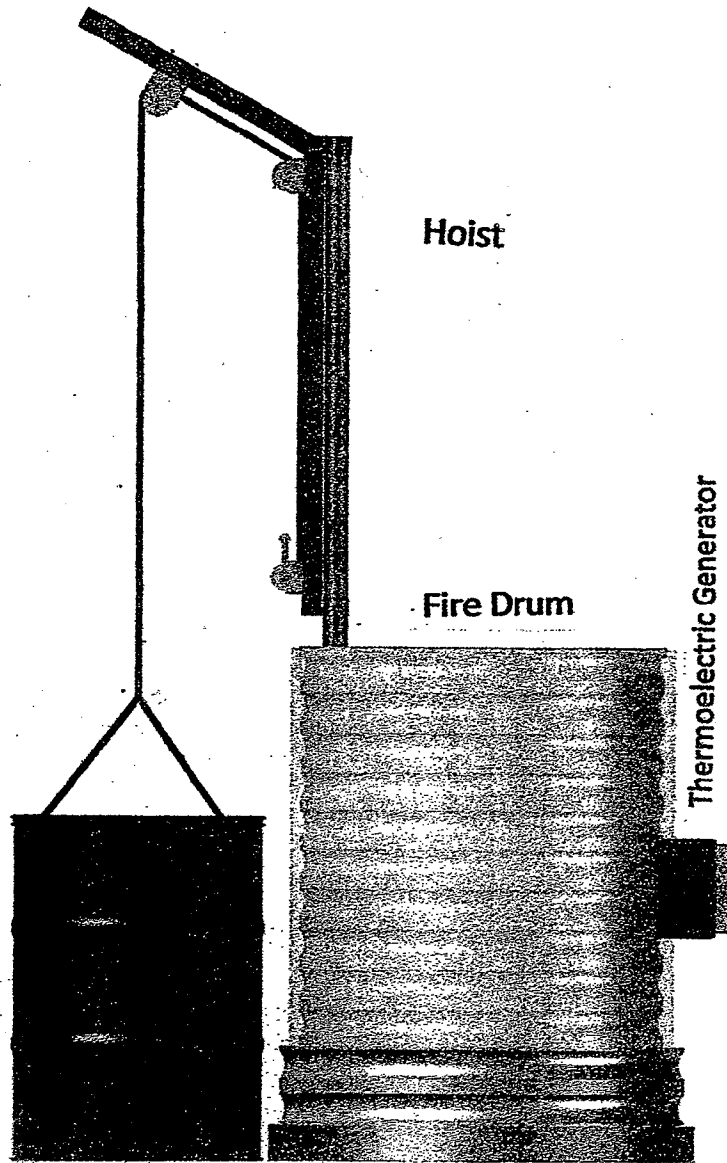
Locate the greenhouse, in your yard where it is not easily seen from the street but an area with not less than 6 hours of sunlight daily. If security is a potential issue, locate the greenhouse in a semi-covert area.



Village Biochar Kiln

17

This kiln is designed to produce biochar while also accomplishing cooking of foods and generation of electricity by thermoelectric means. Steel used for drums must not be galvanized. The concept assumes villagers will share biochar making & cooking tasks, while also sharing electricity produced.

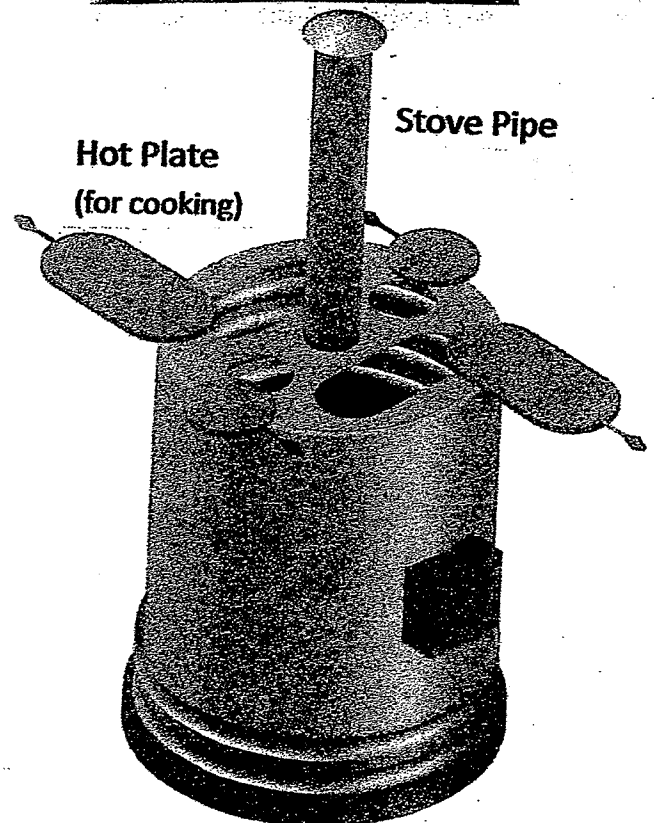


Pyrolysis Drum

N.B. 1) Quality thermoelectric generators are available from Marlow Industries, Inc.

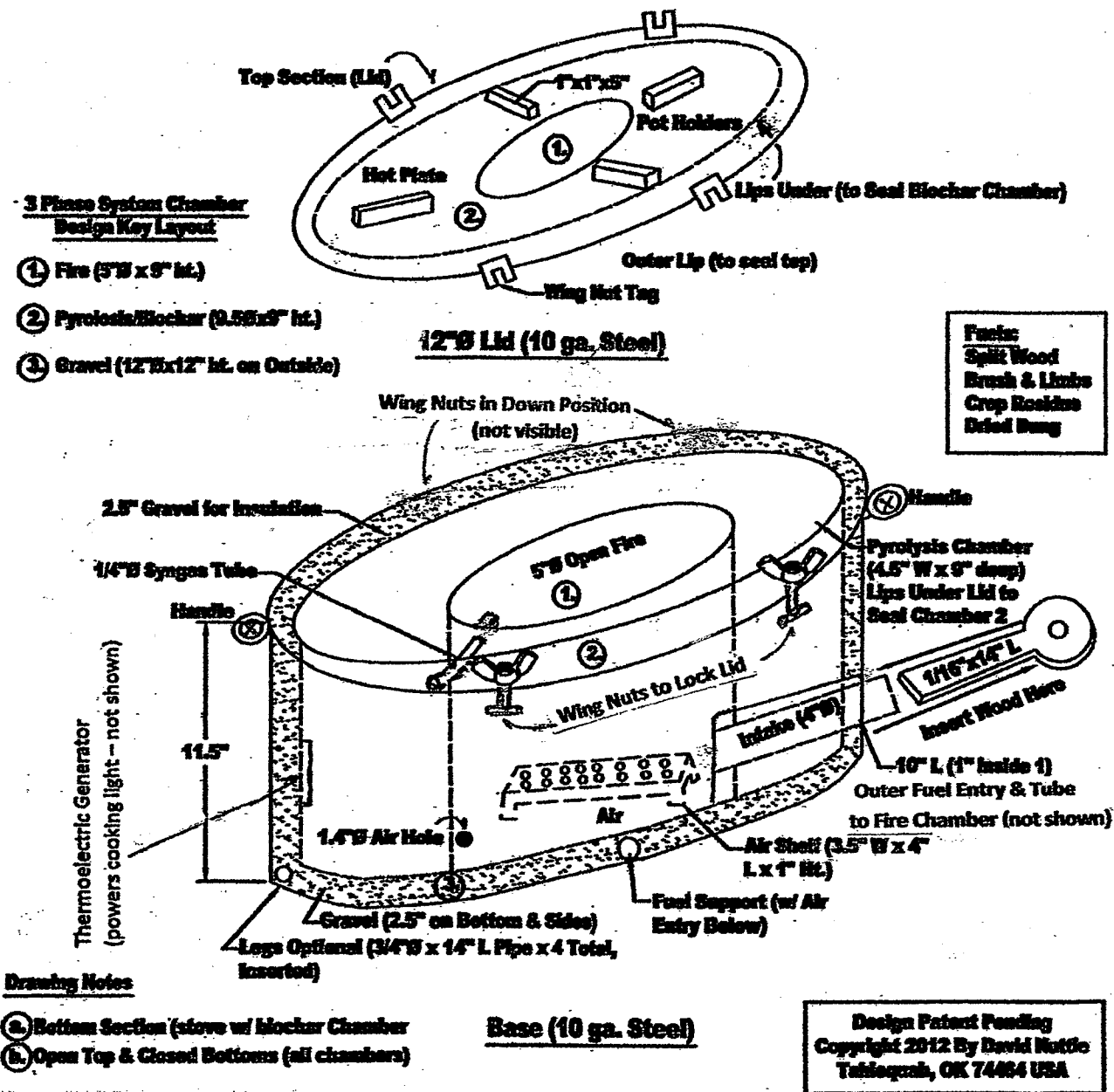
2) The fire drum has intake air holes $\frac{3}{8}$ " dia. about 6" apart, 3" above bottom.

3) The pyrolysis drum has 6 equally spaced $\frac{3}{8}$ " dia. holes, 3" above bottom to allow the escape & burning of syngas.

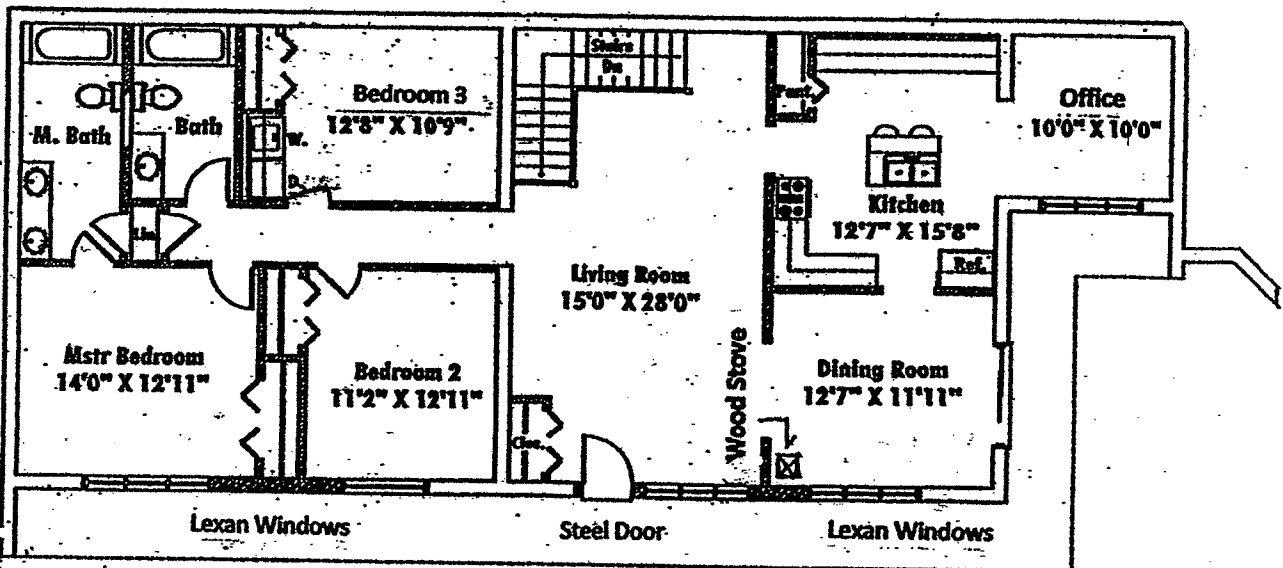
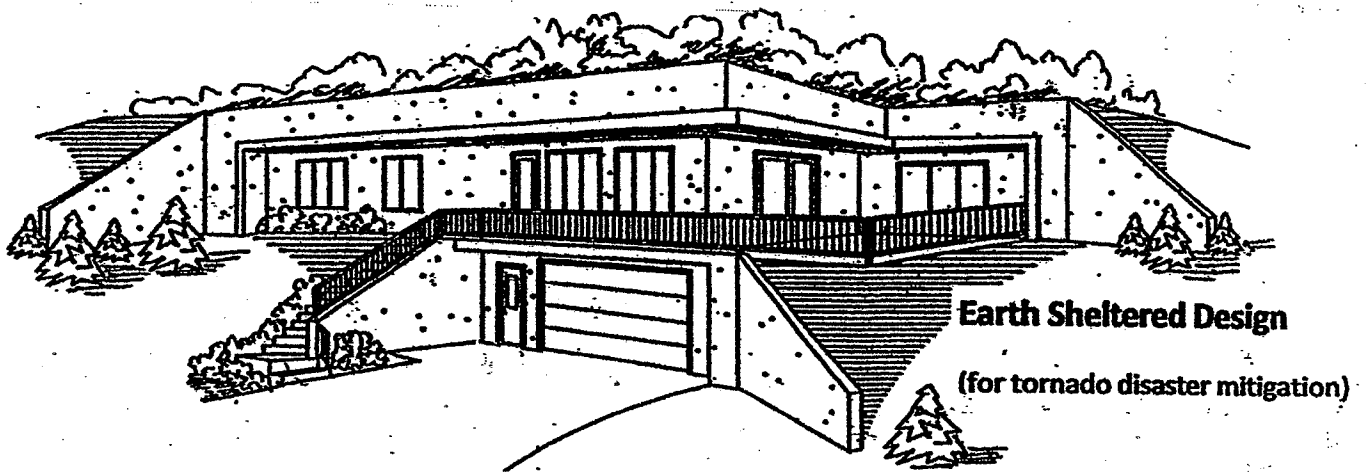


Rocket Stove w/ Biochar Making Means

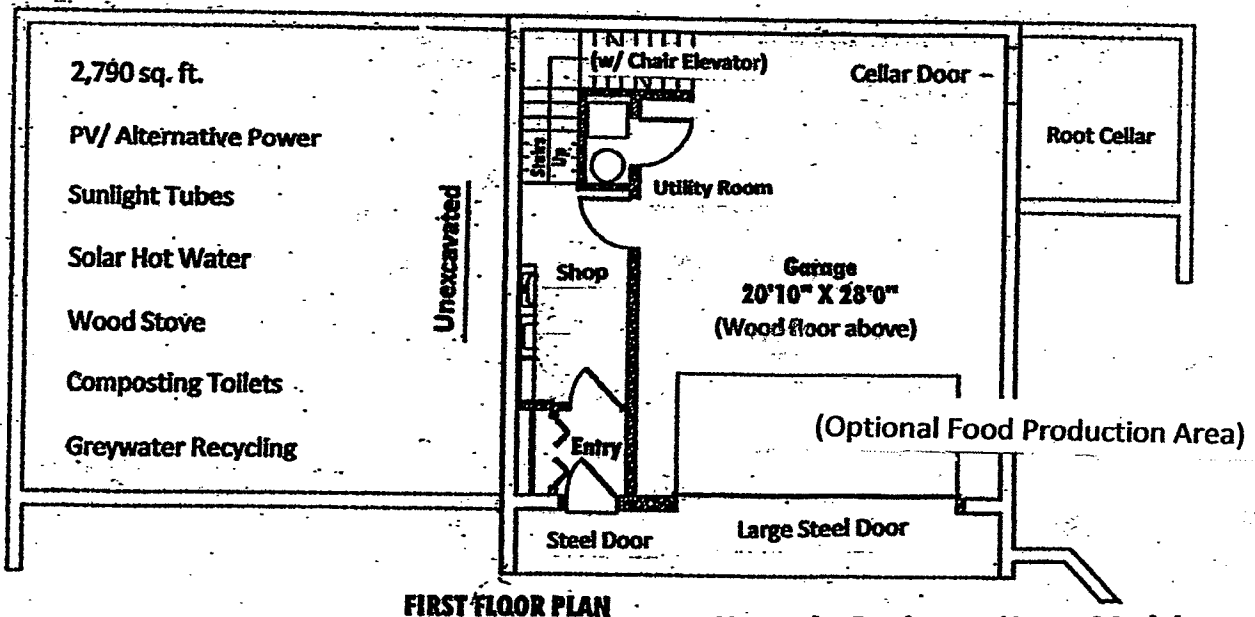
In the case of Third World villagers in need of clean cook stoves, this unique design provides a cooking fire that also heats a pyrolysis unit for making biochar. The act of pyrolysis generates syngas that is burned to provide nearly 80 percent of heat needed for cooking.



N.B. Power for light provided by small thermoelectric generator from Marlow Industries, Inc.
Marlow TG12-6L 30557

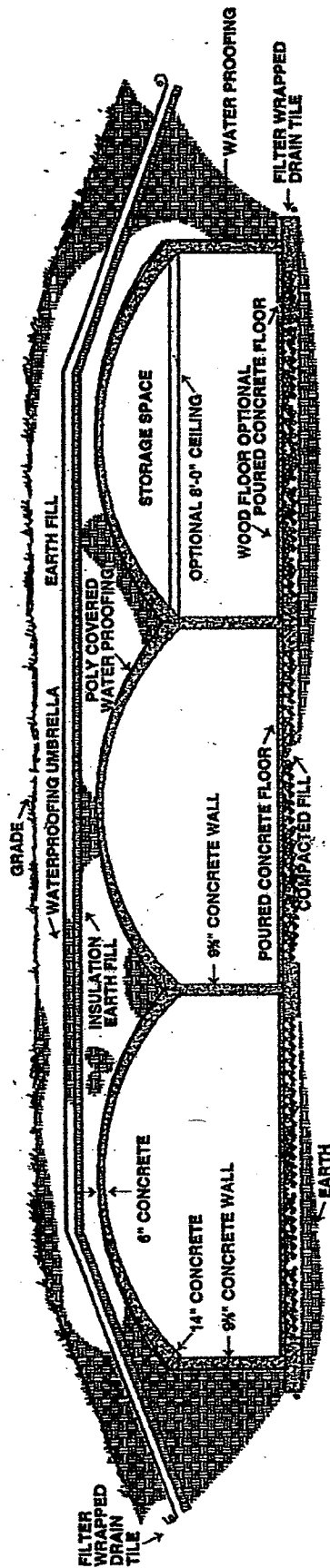


Features:



Tornado-Resistant Home Model

Dome Structure Cross Section



25 REASONS

WHY YOU SHOULD CONSIDER EARTH SHELTERED LIVING

1. **ABUNDANT NATURAL LIGHT** — Your home will have more natural lighting than a conventional home. If you feel that all earth sheltered homes are dark, damp and dreary you have a real surprise coming. Call us!
2. **AN EARTH SHELTERED HOME IS COMFORTABLE ALL YEAR ROUND** — Cool in summer warm in winter
3. **ENERGY EFFICIENCY** — Save up to 80% on heating and cooling.
4. **ECOLOGICALLY SOUND AND AESTHETICALLY PLEASING** You'll love your earth sheltered home for its beauty and compatibility of living with nature not on top of it.
5. **UNIQUE AND EXCITING** You'll be boasting about your new lifestyle and you will get visits from friends that you forgot that you had.
6. **DRASTIC LOW LIFE CYCLE-COST** — Less than 1/4 that of a conventional home.
7. **LONG LASTING** Constructed of concrete, earth sheltered homes will last well over 100 years with
8. **LITTLE OR NO MAINTENANCE** — This means less expense and more time for the family
9. **USE OF CONVENTIONAL HEATING AND COOLING SYSTEMS IS PERFECTLY PRACTICAL** But you will only need a system with approximately 1/4 of the output that a conventional home requires.
10. **PUT AWAY THAT DUST RAG!** Less dust is able to infiltrate and settle on furniture.
11. **GREAT FOR THOSE WHO SUFFER FROM HAY FEVER** Pollen like dust is kept outside.
12. **WATER LINES NEVER FREEZE** — All are nested below the frost line.
13. **SOLAR HEATING** Because the earth remains at a constant temperature in the 50-60's, your earth sheltered home can utilize passive solar with no gadgets needed.
14. **INCREASED YARD SPACE** — Makes small lot larger. More room for lawn, gardens, and family fun.
15. **SUPERIOR VIEWS** Earth sheltered homes pick the pleasant view, not the neighbor's yard.
16. **STORM PROOF** An earth sheltered home keeps your family safe from hail, tornadoes, etc.
17. **TERMITE PROOF** — Say goodbye to insects and extermination bills.
18. **LEAK PROOF** — With our unique concept your earth sheltered home has a written warranty against leakage.
19. **RODENT-RESISTANT** Rodents quickly give up on trying to intrude in an earth sheltered home.
20. **EARTHQUAKE RESISTANT** An earth sheltered home is structurally superior to conventional dwellings. As the earth moves, so does the earth sheltered home. Conventional homes crumble.
21. **DECAY RESISTANT** Being constructed of reinforced concrete, there is nothing to decay
22. **FIRE RESISTANT** Reinforced concrete with earth cover offers the best fire resistance available. No need to worry about a forest fire or a neighbor's fire spreading.
23. **BURGLAR RESISTANT** — Earth sheltered homes have thrown a humdinger of a curve at our less scrupulous members of society their fewer points of entry have crooks scratching their heads.
24. **PROTECTION FROM NUCLEAR FALLOUT** Earth and concrete are two of the most efficient radiation shields available to the general public.
25. **TECHNOLOGICALLY ADVANCED DESIGN** — With our air handling system such things as sweating walls, mildew growth, and stale air are eliminated, and any traces of radon are expelled with the air changes.

EARTH SHELTERED TECHNOLOGY, INC.

P.O. BOX 5142 MANKATO, MN 56001

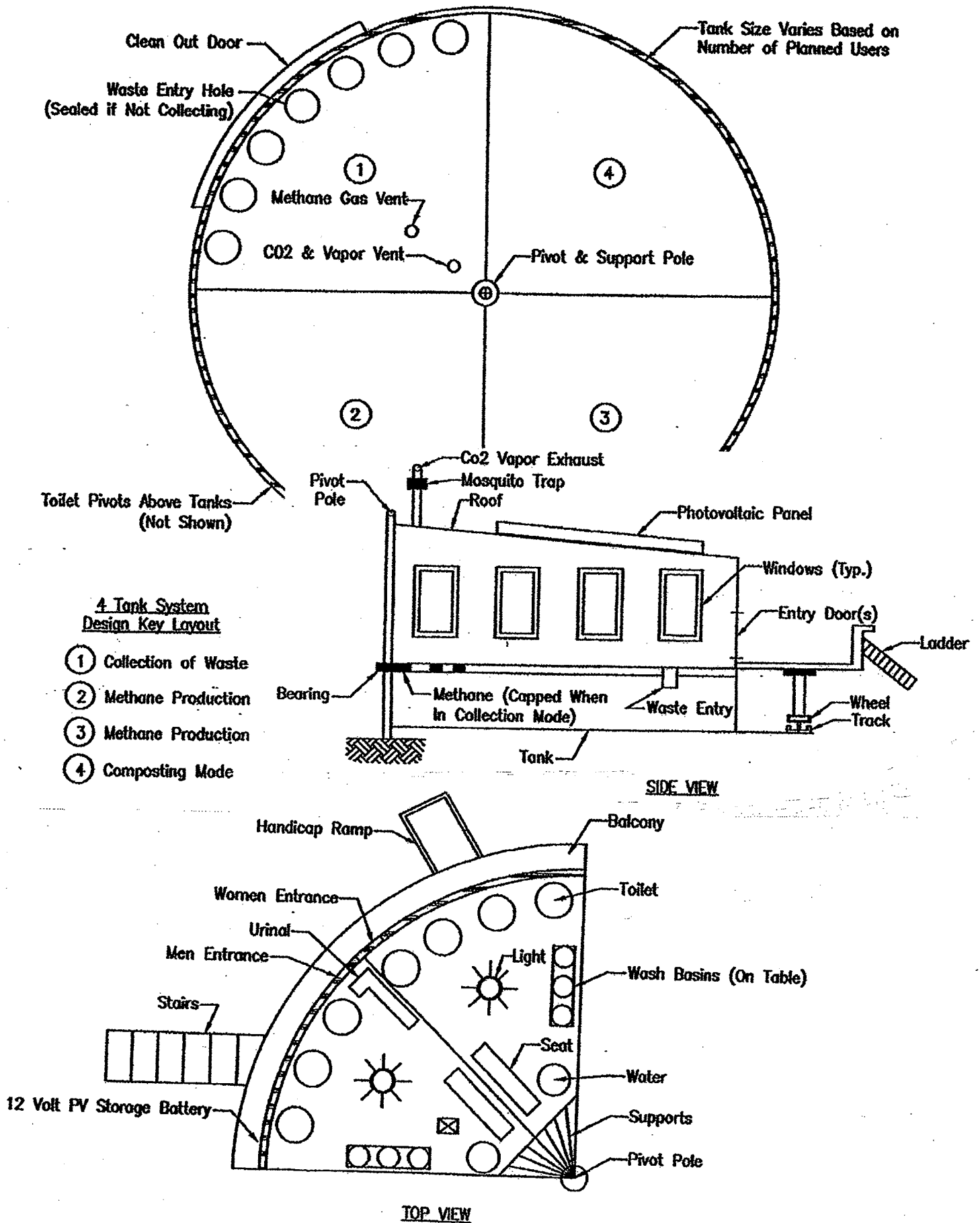
PHONE: (507) 345-7203 TOLL FREE 1-800-345-7203 FAX (507) 345-8302

Contractor for NPI's

Tornado-Resistant Home Model

Community Composting Toilet (Also Produces Green Electricity)

21



Background on the Community Composting Toilet

Section I. The Idea: An Odorless, Waterless Community Composting Toilet w/ Green Energy & Composting Options, by Needful Provision, Inc. (NPI), Tahlequah, OK 74464 USA.

Among the 2.5 billion people, generally without safe sanitation, human waste often comes in contact with water used for drinking, so the bacterium, viruses, and parasites from this type of waste spreads an array of infectious diseases (diarrhea in particular), among these same populations. An estimated 1.6 million children die annually from fecal-oral contamination. Subject idea is based on the distribution and use of odorless, waterless, unique community composting toilets for sanitation, and for production of economical green electricity as well as organic compost fertilizer, for feed crops.

The above approach is creative because a second section of this odorless, waterless community toilet produces methane gas for use in generating green electricity at the local level. Since most of these same populations live without electricity, said toilets can provide electricity for lights, cooking, and TV at a community center. To effectively persuade these populations to use and hazardous waste disposal habits, each individual must get a daily "ticket" as proof they have used the community toilet (that day) to enter the community center, the same day.

When and where needed, a solar water distillation unit may be added as a supplement to subject community toilets to provide potable water for toilet users. The CO₂ exhausted from composting toilets may be used for a carbon sequestration form of algalculture to grow high-protein algae as a food or feed supplement — and the CO₂ may also be used for a very efficient mosquito trap to help reduce numbers of Malaria cases. (Mosquitoes hunt using CO₂ detection.)

The World Health Organization and Centers for Disease Control have scientifically documented that many infectious diseases, for impoverished populations, result from human waste pollution of drinking water sources. It has also been scientifically established that aerobic composting toilets are safe and odorless if constructed properly. Moreover, after collection human waste can be transferred to an anaerobic system that will efficiently and safely produce methane gas. Solids that remain may then be moved to a high-temperature aerobic system to kill bacterium, viruses, and parasites, so these solids are thus safe for use as fertilizer for feed crops (for livestock). All of the components of subject invention are based on scientifically proven, and fully documented, biological methods/ means. (Said innovation is based on a unique, new combination of same.)

Section II. How Testing Will Occur:

A tested prototype, of subject community toilet, will be manufactured in "kit" form for shipment to Kenya, for use by groups of impoverished test populations known to lack sanitation as well as potable water. Twelve such "kits" will be manufactured in the U.S. and shipped to Kenya where personnel working for our charity will assemble each for use by said test populations in remote villages, urban slums, and refugee camps. (Said "kit" is the new tool being developed.)

All the above work will be performed within a budget of USD\$100,000 and a one year time period for Phase I. In Phase II, volunteers from local NGOs (charities) and the Peace Corps will be used to help assemble subject community toilet "kits" in much greater numbers. Once it is demonstrated that these "kits" dramatically reduce the cost of national health care (with Kenya being the first model), it is hoped that governments will purchase and help distribute these "kits." Our charity is also creating a unique global barter system to help impoverished populations to easily acquire said community toilet "kits."

page 2 – Community Composting Toilet

During Phase I, the essential data collected will focus on “kit” cost, assembly requirements, full performance (based on anticipated results), use factors, community benefits, & disease reduction for users (local populations), and their livestock as well as area wildlife. Results will be published and provided to Gates Foundation, the Government of Kenya (GOK), World Health Organization (WHO), and others. In Phase II, the focus will be on manufacturing subject “kits” in quantity, and reduction of manufacturing costs, as well as improving global distribution & service means.

N.B. 1) Early testing of alternative toilets indicated that impoverished populations will seldom act to change defecation habits, unless given a strong incentive to do so. Thus, the use of community centers, with lights and TV (under the above said ticket system), proved to provide that type of incentive for any group of people living without electricity. Moreover, existence of such local community centers usually resulted in a reduction of new HIV infection rates by over 50 percent (due to positive changes in social habits).

2) Each prototype composting toilet is designed to handle waste from 80 to 120 local users -- as located in rural villages, urban slums, refugee camps, and other areas. The four tanks needed to operate each system are too heavy to be easily moved after being filled w/ waste. Thus, toilets are elevated, and may be moved (pivoted on one end using a center support), with the other end having three supports & wheels (moved as needed on an outer track). Thus, each toilet is moved (according to the system schedule) over any single tank used for collection of waste, in an aerobic mode. Two tanks, with waste, are sealed and converted to anaerobic mode to produce methane gas to power an electric generator (operating on methane) to produce electricity. The fourth tank is converted to high-temperature aerobic composting to kill bacterium & viruses, as well as parasites, so the remaining solids may be used for compost fertilizer (for feed crops). Once the tank with prepared compost is emptied, that tank again returns to waste collection mode.

3) In typical users areas, the above said elevated toilets greatly reduce problems with insects, rodents, snakes, wild animals, and livestock. With a proper design, to include a ramp for handicapped persons, the elevated toilets tend to attract users with a special appeal that is thought to be similar to a typical tree house (for youth). In the hot tropics, elevated toilets are also easier to cool. For a few tribal cultures, defecation is a social experience with 2 or 3 men or women going together in the bushes. Subject toilets may therefore be designed to maintain privacy while facilitating eye contact and conversation (as appropriate for any one culture).

4) Subject composting toilets and tanks may be constructed in various sizes, to include ones small enough for an individual family with several children. For purposes of initial field-testing, in Kenya, only toilets with a capacity for 80 to 120 people will be constructed.

5) The final toilet design will be accomplished by Leon Ragsdale, an architect having over four decades of experience in designing new self-help products for developing nations (over and above his usual architectural practice). Pre-engineering of toilet manufacturing, selection of a qualified manufacturing firm, and supervision of the manufacturing of said prototype toilet “kits” will be accomplished by a skilled staff of engineers, having appropriate qualifications. All of these engineers are employed by Hays Engineering, of Broken Arrow, Oklahoma.

Inventors: David A. Nuttle
Hill Trammell

David A. Nuttle, President
Needful Provision, Inc. (NPI)

SITUATIONAL SECURITY

During rioting, looting and insurgency, or civil war situations, all now a possibility for the U.S., it is important to make adequate preparations for personal security and the security of your food stockpile. Under extreme emergency situations & related martial law, our own government may take your weapons, ammunition, gold, silver and food storage by armed force.

In all of the above situations, the only defense is to have items that may be seized in some type of secure/ hidden storage. The idea is to appear that you have nothing, so the bad guys will move on to search others. Storage behind false walls, with carefully hidden entrance is often a good concealment option. Other possibilities include false box-springs under your mattress for storage you sleep on ... or a hidden, underground commercial tornado shelter (see tornado-storm-shelters.com) buried in your yard or a remote area (some people are even using national park land for such hidden storage). The idea is to be creative in making your hidden storage.

Whatever you do to undertake the above, do not communicate your plans by telephone, email, Facebook or any form of open communications now monitored by NSA and others. In addition, it is best not to talk about your ideas to anyone, indoors or outdoors given all the new types of remote listening devices. Be safe, rather than sorry, even though the possibility of your being a target of remote surveillance is remote. Use alpha-numeric code-words in open preparedness written communications. Key words used for clandestine communication are taken from your own secret chart with those words identified by their position on the chart; e.g. Bravo-Three for meet; Charles-One for conceal; or Echo-Two for drop (...see the example below):

	A	B	C	D	E	F
1			Conceal				
2					Drop		
3		Meet					

N.B 1) The above code system is similar to tap-code systems developed and used by American POWs in Vietnam. In the event of an extreme national emergency, some Americans could be declared potential enemies of the state and held in concentration camps as nearly all Japanese-Americans were during World War II. This possibility is remote unless you are near an armed Patriot group attacking a government entity, but it's good to know the concept of tap-codes.

2) A 72 Hour Emergency Kit checklist follows to show food and other essential items most needed in evacuation situations. These kits needs to be in every home, business and vehicle.

NPI's 72 Hour Emergency Kit

1. Health Related Items: First Aid kit, personal medications, sanitary items, extra pair of glasses (as needed), NewSkin (for blisters), a small dust mask, and potassium iodide (for nuclear disasters).
 2. Communications Related Needs: Cell phone, 3-power option AM, FM, SW, NOAA Weather Radio (powered by batteries, solar, and/or hand-crank generator...w/ connection to also charge cell phone). Signal mirror, whistle, and hand-held flare.
 3. Light Options: 2-power flashlight/ lantern (powered by batteries and/or hand-crank generator).
 4. Fire Starter: Metal match & fire starter mix, and/or matches in a waterproof container.
 5. Warmth: Emergency/ space blanket, poncho, appropriate clothing for the weather, heavy socks, and hiking boots.
 6. Cool: Shade cloth, hat, light weight clothing, flip-flops, and evaporative cooling neckerchief.
 7. Shelter: Heavy duty tube-tent and ground cloth (or small tarp).
 8. Water: Filter device, chemical water purification means, water bag, and 5 gal. glass water jug (w/ potable water) on a small, heavy-duty hand-cart (provides 1 gal. per person day and sanitation needs).
 9. Food: 15 energy bars (5 per person day). If you believe you may be gone longer than 3 days, add appropriate dehydrated (light-weight) food items plus salt/ pepper.
 10. Sanitation: Small, portable composting toilet and sanitation chemicals, along w/ toilet paper, moist towelettes, and plastic trash bags.
 11. Tools: A good multi-tool w/ pliers, screwdrivers, and wrench ... plus hunting knife or hatchet, leather work gloves, as well as manual can opener (P-38 or other).
 12. Defensive Items: Pepper spray, Taser, baton, and/ or personal weapon (if licensed).
 13. Maps, Vital Documents & Family Photos: Area maps, originals of birth certificate, social security card, passport, and driver's license. All this plus other vital documents and family photos on a document storage device.
 14. Special Needs: Infant formula, diapers, pet food, cash/ traveler's checks, barter items (such as silver coins), feminine needs, plus mess kits w/ paper towels & utensils, and something to smother a fire, or a small fire extinguisher.
 15. Stress Relief Items: Cards, games, puzzles, paper, pencil(s), and your favorite candy.
 16. Content Locator: List of contents (in a plastic zip-lock bag) to help you find needed items under conditions of stress or darkness. (Pack items in category containers, and label each.)
- N.B. 1) In addition to the above, a good backpack is needed to carry all the above except for the 5 gal water jug (see 8 above). Be sure to add a rain cover for your backpack.
- 2) For the item 8 water jug, glass is needed only if you plan UV sterilization of possibly contaminated replacement water; i.e. 6 hours in direct sunlight.

MARKETING SURPLUS FOODS

As you expand your home food production and grow a surplus of foods, you may want to sell some of the surplus to help recover your production costs, and to generate income. The tips given below are intended to help you decide if, when, and how you plan to sell any of your surplus foods.

Security considerations in the event of riots, government confiscations or other hazards, all suggest that you should not make your ample food production known to the public or persons with the potential to do you harm ... because you are known to have food while others may be in a panic over food shortages. In brief, selling food from your home may make you a target at some future date.

Our government is now primarily an oligarchy influenced, if not controlled, by the elite (wealthy) one percent. Part of that one percent, the factory farms and large biotech companies, seek to dramatically reduce the amounts of foods grown/ sold by smallholder farmers, urban farmers and home gardeners. To reduce food production and sales by smallholder/ gardeners, the one percent used "political payola" (bribes) to persuade members of Congress to create and pass the "Food Safety Modernization Act," with FDA imposed rules that will make it very costly for small growers to sell at farmers markets, or by other means. These new regulations are more about harming small growers than improving food safety. Thus, sales of your home-grown foods could be very costly unless sold via a clandestine market (and this approach may result in fines and jail time if you are caught in the act of selling foods).

To help circumvent the above problems, my charity (NPI) helped 84 Montagnard refugees, from the Greensboro, NC area to organize an organic food production coop, Hero Farms, Inc. (HFI). These refugees, political refugees who were forced to flee communist Vietnam to save their lives, will operate home food production systems such as those presented herein, as well as a few urban gardens on vacant lots and in vacant buildings ... with a few having small farms in the same area. Foods and value-added food products they produce will be sold under HFI after being processed and inspected at a government supervised food processing facility near Greensboro. By this means individual growers are not identified to the public, and food safety inspections will be accomplished in a cost-effective manner.

HFI will be producing three value-added food products. To wit: 1) Cut, mixed, triple-washed and bagged salad greens; 2) Cut, mixed, triple-washed and bagged vegetables for stir-fry use; and 3) A fruit-veggie bar with a popped Amaranth base and local honey. HFI will operate its own small food market, and may also sell some of these foods to Greensboro area grocery stores. The value-added concept is what increases profits considerably for home-grown foods.

FOOD SAFETY

If you produce your own foods by organic means this will avoid all the hormones, antibiotics, herbicides/ pesticides and other potentially harmful chemicals, and GMOs, as well as the fillers, preservatives, food coloring and suspect elements added by food companies. In brief, having your own home grown organic foods is the major part of food safety.

Other basic food recommendations are as follows:

- 1) **Clean:** Triple wash fruits and vegetables in clean (potable) water. Wash your hands with clean running water adding soap and scrubbing until your hands are fully covered in a lather for not less than 20 seconds.
- 2) **Separate:** Keep all types of foods separate and use a separate clean cutting board for each. This will help avoid cross-contamination or the migration of pathogens typical of certain foods. Some vegetables may be eaten raw after separation and cleaning. When cooking foods, they may be mixed at that point in time (except in the case of poultry).
- 3) **Cook:** Use a food thermometer to be certain that meat, poultry, fish and casseroles are cooked with sufficient temperature to kill any pathogens that may be present. Cook at the temperature and time, as well as method recommended for each specific food.
- 4) **Chill:** Before cooking, and in the case of leftovers, use a good appliance thermometer to make certain your refrigerator is below 40 degrees F (to prevent growth of bacteria). In the case of your freezer check to make certain temperatures are 0 degrees F, or below. For Third World users of this food production system, my charity (NPI) will be making its solar-zeolite refrigerator-freezer available for those without power.

PLANNING

Given the costs of home food production, it is best to develop all your production systems in stages after making financial plans to determine how you will cover the various expenses. If you expand to produce and sell surplus organic foods, it is helpful to write a detailed business plan to include specifics on how you will process, package and market foods. Keep in mind that your cost per food item should be reduced as you expand your home production capabilities. In the event you expand enough to be considered an urban farmer or smallholder farmer, use "A Workbook for Beginning Farmers" for a planning guide. This workbook is available from the Natl. Sustainable Agriculture Information Service or NCAT (www.attra.ncat.org).

WATER ISSUES

If polluted/ contaminated water is used for washing foods, cooking and/or drinking, illness may result that prevents healthful utilization of nutrients in the foods consumed.

Municipal water supplies generally contain silicoflourides, from flosilic acid, acid that several researchers now believe could be harmful to health. In addition, chlorine is usually added to combat any microbial contamination. Scientific research has proven that if chlorine combines with any organic matter in the water, carcinogenic (cancer causing) Trihalomethanes may be produced. Such water may contain nitrates from fertilizer runoff, as well as POPS (Persistent Organic Pollutants) from water polluting makers of paper products, vinyl plastics, and siding. This water may also contain "cocktails" of herbicides/ pesticides and pharmaceuticals that have been improperly disposed of. In brief, water supplies often need to be filtered for protection of health and achievement of optimal health benefits from food nutrients.

On a global basis, a reported 768 million people do not have regular supplies of safe water. Over 700,000 children yearly are said to die from drinking polluted/ contaminated water. As noted in the Introduction, an estimated 2.5 billion people do not have adequate sanitation, so most of their water is polluted with human waste. The results are health problems in the form of diarrhea, guinea worm, trachoma, schistosomiasis, plus an assortment of other disease and parasites. Access to clean water results in improved food safety, reduction in poverty, better work performance, and time at school for the children who are often forced to walk miles daily to collect and haul water ... water that is usually polluted.

Clean (potable) water is increasingly in short supply, worldwide. Water to irrigate crops is less and less available, so micro-drip irrigation using sub-surface delivery has become necessary to have enough water for crops as well as human populations, livestock and wildlife. Water shortages are already the cause of major conflicts such as the one in Darfur (in Sudan). Some states are currently in legal battles over water rights. More and more people are harvesting and storing rainwater, but even rainwater may be contaminated (in some areas) as the rain flushes pollution from the air. In the future, having an adequate supply of clean (potable) water will be an important part of food security.

Iodized Salt

The good health of many populations will often depend on having a reliable supply of iodized salt or iodized sea salt. Minute amounts of iodine, in the diet, are required to prevent endemic goiter as well as some intellectual and development disabilities.

School Gardens

All of the food production techniques presented herein may be miniaturized or presented as models for use by school teachers in teaching agriculture, math, science, resource conservation, biodiversity, biosecurity, environmental protection and others subjects. If the school does not have indoor space for models, small greenhouses outside/ near schools may be used for display and operation of the models (see page 16 for a suggested greenhouse design). For other ideas on school gardens see www.woollyschoolgarden.org. (These school models are also very useful as training aids for agricultural training centers in developing nations.)

Expanding Food Production

Most scientific evidence suggests that factory farming and GMO farming methods are not sustainable over the long term. The many chemicals used in these farming methods are now known to be killing soil microbes and thus reducing natural soil fertility in a manner that makes soils less productive. In an earlier example, I reported that Monsanto's glyphosate, used in its herbicide Roundup, is found in most GMO corn and GMO soy ... and the animals fed same were scientifically proven (in university research) to develop cancers and sterility. This is just one example, of many examples, of how the biotech companies are harming our food production capabilities. When you add our increased drought, flooding and other adverse weather, food production, in the U.S. and worldwide, could dramatically decrease in the near future.

To counter the above situation, it may be essential to start growing more local crops using the viable, organic means herein presented. Think about the possibility of urban farming using leased vacant lots, vacant buildings/ factories and available park lands, as well as on roof tops, and alongside assorted building walls where vertical gardening is possible. Use of edible landscaping is also a means to produce a number of crops. For more information on this subject, see website www.rosilandcreasy.com/edible-landscaping-basics/. My charity, NPI, will be using all of these urban farming techniques to help 84 Montagnard refugee families, in Greensboro, NC, achieve food security for themselves ... while also producing enough extra foods and value-added food products for each family to achieve a good annual income. The food production technologies used for said effort are the ones presented in this handbook, but employed on a much larger scale.

Seed Savers

The biotech companies selling seeds are placing terminator genes in their seeds so they do not grow again if saved. Use and save your own organic seeds (see www.seedsavers.org/).

Motivational Factors

The motivation behind the healthy foods movement and home grown foods is driven by problems with our conventional food production systems, as I have partly outlined in prior sections of this handbook. A complete checklist of these factors is provided below:

- 1) Climatic change, for whatever reason, is causing more drought, flooding, hurricanes and adverse weather events that act to reduce crop production.
- 2) Factory farming methods are "mining" our soils of nutrients and minerals that are not being replaced by chemical fertilizers or other means, so foods produced by these methods contain fewer useful nutrients.
- 3) The herbicides/ pesticides used in factory farming and growing GMO crops are now killing soil microbes and thereby reducing natural soil fertility.
- 4) Some pesticides are killing our bees and other pollinators needed to pollinate many of our foods and thus help sustain food production. The EPA and other regulators have not been willing to stop the manufacture and sale of such pesticides because doing so would reduce chemical company profits.
- 5) Some GMO crops are causing health problems. As an example, GMO corn & GMO soy contain glyphosate from Monsanto's herbicide Roundup ... and university research studies have proven that animals fed with such GMO crops develop cancers and become sterile. Humans consuming these crops in foods are expected to experience some of these same health problems.
- 6) Conventionally produced foods typically contain antibiotics, hormones, herbicides and assorted other chemicals, some heavy metals and other harmful elements.
- 7) Foods purchased from grocery stores often contain preservatives, fillers, food coloring and extra sugar (usually fructose corn syrup) and salt. Prices on these foods are inflated and the package sizes keep shrinking.
- 8) During natural and/or human-caused disasters, the shelves at grocery stores would soon be empty. These shelves would remain empty if the food trucks are unable to transport.
- 9) Factory farming and the use of GMO-related chemicals are creating super-bacteria, super-bugs and super-weeds that are becoming increasingly difficult to control. The new chemicals developed to deal with these problems, such as Dow's 2,4-D product, will do more harm to all living things.
- 10) Monsanto is operating a "shadow government," with former employees who are fanatic biotech promoters in "key" positions throughout government where they can protect Monsanto's ability to manufacture and sell products known to be unsafe. These same individuals eventually return to Monsanto at higher pay levels, and bonuses for all their help as government employees.
- 11) The decline in water and other critical inputs, needed for crop production, will soon prevent sustainable food production by factory farming methods.

Third World Frig-Freezer

In many developing nations, also known as the Third World, over 2 billion people lack electricity or other affordable means to power a refrigerator (frig) and/or freezer to help preserve foods on a convenient basis. This problem may be solved by providing solar-zeolite frig-freezers to these populations at a reasonable cost, or by means of barter trade. Using an adsorption-desorption techniques cooling is facilitated by utilization of zeolite clay, water/ water vapors, & sunlight (solar energy) in a manner that helps ice to form.

During the night, zeolite is cooled close to ambient temperature and starts adsorbing water vapor. Open sides of the solar collector allow night air to cool the zeolite inside the PVC pipes. Liquid water in the storage tank adsorbs heat from the space to be cooled, and is converted into water vapor. The system is sealed under low a pressure so water remaining in the tank is frozen into ice ... so when the ice slowly melts, cooling occurs.

The ZeoPower Company and EG Solar have been manufacturing commercial versions of subject frig-freezer. The author's charity, Needful Provision, Inc. (NPI) is preparing to manufacture an advanced version of said solar-zeolite frig-freezer for use in barter trading with remote and very impoverished populations in urgent need of such food preservation means. NPI's barter trading partner QL2 (Quick Lift Two), is based in Kenya.

