2024

All-in-One Guide

NO GRID SURVIVAL PROJECTS

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STEP BY STEP Diy Projects

EXCLUSIVE BONUS INSIDE

Complete Collection with Actionable and Practical Advice

NO GRID SURVIVAL PROJECTS

Unlock Essential Skills, Power Your Life Off-Grid,
and Arm Yourself with a Lifesaving First Aid Kit.
Your Ultimate Guide to Thrive in Any Situation!

VINCENT M. POWELL

Table of Contents

Introduction

For millennia, our ancestors have lived off the grid as technology advanced and society embraced public services.

Now, today, living off the grid has become an interesting option for many.

Off-grid living is gaining momentum by the day, lately due to rising electricity costs, advancing technology, and the availability of alternative energy sources.

Living off the grid usually means you are self-sufficient and can do some of these activities:

- Make your own electricity.
- Grow your own food.
- Raise animals for your consumption.

- Access to drinking water.
- Live in a small building.
- Live on the outskirts.

Among the benefits of living off the grid, you can find:

Fight Against Climate Change

Burning fossil fuels produces greenhouse gas emissions, traps heat from the sun, and contribute to higher global temperatures. For example, in the last ten years, it was the warmest on record, with Earth now around 1.1°C (33.9F) warmer than it was at the end of the 19th century.

The impacts of climate change are already seen around the world, from extreme weather events to rising sea levels and reduced biodiversity.

For example, if you live on solar power and have a battery system, you don't lose power during a storm as you do on the utility grid.

Off-grid homes generate far fewer carbon emissions and associated greenhouse gases than average.

Those who choose to live off the grid often have a more minimalist and self-sufficient lifestyle that includes growing their food, raising their livestock, and recycling and reusing goods.

Reduced Dependence on Fossil Fuels

The American household makes an average of 7.5 tons of CO2e per year. Homeowners don't consume as many off-grid resources compared to a conventional life.

When you live off the grid, you use fewer fossil fuels (e.g., oil, coal, natural gas) for energy, which are major contributors to climate change, air pollution, and water pollution.

Reduction of Greenhouse Gas Emissions

About 20% of US greenhouse gas emissions are from residential uses. Renewable energy sources are becoming more and more cost-effective every day, making the transition to off-grid life easier.

The most common renewable energy source used by off-grid homes is solar. However, battery storage technology must be kept in mind so that the solar energy captured from the solar panels is used. The average home requires about two batteries to store all the energy required to continue living off the grid.

Despite requiring a somewhat high initial investment in solar energy, it is believed that you can recoup your investment in as little as 3 to 5 years. But the investment in battery systems may take longer to recover, although it is a system that will last about 30 years, with minor maintenance.

Food Safety

Climate change impacts food production, leading to lower yields and drought affecting farmers' ability to grow crops and meet production demands. If food is not available to meet the demand, food costs and food insecurity will increase.

Some people live off the grid and have a farm that has chickens, cows, and other types of livestock; some have orchards, while others have immense spaces for their varied crops.

Growing food reduces pressure on the world's supply chains and significantly reduces emissions. For example, if you buy an orange at the supermarket, think about the whole journey of that fruit to that place.

However, if you are off the grid, you grow food suitable for the local climate and that does not require a trip to be sold. Therefore, there is no use of contaminants in the process.

The four pillars of food security are availability, access, use, and stability. Being off the grid allows you to maintain food security without relying on others. Knowing where it comes what you eat and its process is invaluable today.

At the supermarket, it's impossible to know the quality of what you're buying, but being off the grid, you know you're getting fresh, healthy, and high-quality food.

Self-Sufficiency

When you live off the grid, you are self-sufficient because you create your resources and generate your electricity. So, if your local supermarket loses power or runs out of groceries, you won't be affected too much.

Skill Development

By living off the grid, you no longer have everything at your fingertips, which means you need to rely on your skills.

Living off the grid allows for the development of valuable, tangible, and practical skills such as food canning, gardening, generating electricity, mechanics, logging, and gathering/hunting. These skills are necessary because they increase self-sufficiency and help limit your impact on the environment.

Improve Mental Health

Living off the grid provides a rhythm and change of life circumstances. Often attributed to a simpler, calmer, and more peaceful lifestyle.

Living off the grid improves mental health because it offers a sense of freedom, empowerment, and purpose not so readily available in ordinary life.

Living off the grid means leaving home away from the hustle and bustle of typical city life. This lifestyle offers a connection to yourself, your family and loved ones, and nature.

Many people with off-grid homes grow and eat fresh, organic food free of chemicals and preservatives.

Eating a nutritious diet will benefit both your physical and mental health, and taking the time to tend to your garden also increases feelings of well-being and connection to nature.

Saving Money

Considering that most people generate their electricity and grow their food, the monthly costs associated with living off the grid are minimal.

Practical Life

Going off the grid becomes an attractive way of life for those looking to reduce their environmental impact and day-to-day costs. While the initial costs to achieve this change (e.g., building a home, and installing solar panels) may be costly, the long-term savings and return are worth it.

Chapter 1

Shelter Projects

Let’s build some shelters considering the conditions where you are. They can be in nature, in your house, and even with branches and some knots. Each with its tools and practical prepper tips.

Build a Shelter in Nature

Difficulty: Easy

Tools

- A folding saw or some type of compact hand saw
- Axe
- Some kind of strong wire, rope, or twine

Construction Options

A shelter is necessary to live off the grid. Finding resources in the area to help build and craft insulation makes building easier. Before you begin your construction, inspect the area around you to make sure you have everything you need, from strong support beams to insulated structural beams.

Small trees between 10 and 20 inches in diameter make good support beams. Bearing joints generally run vertically and serve to maintain the integrity of the wall or ceiling structure. Often, support beams cut to the moment provide added strength and durability. Previously fallen trees rot and weaken the wood.

The branches of evergreen trees such as pine trees are good insulators. After you put up the support beams and walls, cover the outside of the shelter with branches, leaves, and earth. The floor serves to protect the shelter from the cold at night and from the heat during the day. This insulation also serves as waterproofing, so it is possible to protect your shelter even against the snow.

Knots

Everyone who plays survivors has extensive (or at least rudimentary) knowledge of knot types. Knots are useful for many things when out in the wild, hiking, and backpacking, including building shelters, setting up campsites, securing food, and drying clothes. Knowing how to tie basic knots will help you a lot.

There are many types of knots to choose from when building your shelter. Some are great for holding weight; other knots help keep parts put in place and some knots just hold things where they should be.

Some knots are especially useful for living off the grid. Nail hooks are great for creating shelters because they have a strong grip and come in handy for attaching things, like the walls of a shelter or the support beams of a bed.

The tension knot is perfect for tightening the corners of tarpaulins and tents. Tarps are waterproof for your shelter and must be adequately protected from weather elements such as wind and rain. Once the shelter

is secured with several knots, it’s time to begin your camping and hiking adventures.

The plan is to build it by creating a cone-shaped house according to your size, making the supports at the bottom wider against the ground, and ending up attached with rope. Use the saw to cut the branches. If you have more rope, you can assemble a door so that you can place it in the part where you enter; also the walls that you make in the shape of a cone can be protected with dry branches or whatever you find around. This is a temporary shelter, not a permanent one.

Build a Shelter in the Desert

Difficulty: Medium

Tools

- Miscellaneous trunks as available
- Debris
- Branches, leaves, and any element of nature that serves as a roof
- A handsaw

The Construction Process

Start by finding a location:

When you make a shelter, it is important to see the area. Try to choose a location sheltered from the wind and confirm that water does not enter or run over the area when it rains.

Insulate the floor:

Start by building a rectangular frame out of logs. Fill the frame with detritus, such as dry leaves or branches that you find. Rubble offers insulation and prevents the floor from stealing heat from the body. This is very important because a large part of the body heat is lost in this way.

Build the shelter:

Please note that this shelter is for emergencies. Therefore, the size is for you to fit. The most efficient design for this type of shelter is for you to adjust the poles on each side of the shelter to meet at the top. Keep building the frame and put the sticks from front to back. At this stage, it's good to think outside the box and be creative with how you join the sticks.

Stack:

After you build the frame, it's important to place a thick layer of gravel outside the shelter. This is the part that takes the most time while building. Stack leaves, twigs, and logs all around the frame. This insulation should be 4 to 8 inches, enough to keep out rain and keep the interior of the shelter dry.

The key here is to keep in mind that this is a temporary shelter designed to keep you alive, not comfortable. The interiors of natural debris shelters are damp and shady, and can even leak. Being uncomfortable and alive is better than other options.

The Tarp Shelter

Difficulty: Easy

Tools

- Plastic tarp
- Strings

The Way to Do It

All you need is a plastic tarp and rope to create this shelter. It can even be done with a raincoat. Simply tie the ends of the tarp to a tree.

Snow Shelter

Difficulty: Easy

Tools

- Emergency shovel
- Tree
- Branches
- Pine needles

The Way to Do It

What do you do during an outdoor emergency in the snow?

Find a tree and hold a branch against the trunk at a 45-degree angle. Remove snow blocking the path to make a “wall.” Support another branch by holding the tarp. Then cover the branches with a tarp.

Line the interior with pine needles and brush for insulation and warmth.

Turn Your Home Into a Shelter

Difficulty: Medium to difficult

The difficulty of this project involves adapting to the various conditions that exist in the home and modifying the best spaces to use while living off the grid.

Tools

- Space in the home with safe walls, without humidity, and with an adequate temperature to keep canned food, water, and other projects that we will develop later
- General construction tools (hammers, saws, chisels) according to the conditions and adaptations you must make
- Drinking and technical water
- Cash
- The stock of long-term storage products
- Fire extinguisher
- First aid box
- Survival kit
- Flashlights, spare batteries, and candles
- Warm blankets, sleeping bags, and thermal underwear (in case of the cold season)
- Gas burner with additional cylinders for cooking

The Adaptation Process

If you think of building a habitable space in or near your house, do not go digging a hole in the garden and making an underground shelter. After this, the bunker could kill you. If you have a basement or cellar, you may have the foundation for a viable living area. What to do to turn the basement into a living space and what mistakes to avoid when setting up a new area? Here are some tips to keep in mind.

Using the basement as a living space has its advantages. If you find yourself in a difficult situation, just go downstairs and close the door behind you. However, basements are fickle, and before using them to prevent a disaster, you need to make sure the structure is solid.

Basements are notorious for being damp, as it seeps through the walls. Since this room is usually below ground level, the water does not evaporate or dry. This can be a big problem if you want to use your basement for storage, especially if you want it as a survival shelter.

Incoming water can also promote mold and mildew growth if left unattended, which can be dangerous for anyone sheltering there, as exposure to mold and spores could lead to respiratory infections, which is bad for anyone who already has breathing problems. It is especially dangerous for those with systemic diseases, such as asthma or chronic obstructive pulmonary disease.

Some indoor plants can help control the purity of the air, turning carbon dioxide into oxygen and filtering out some of the toxins present. They shouldn’t be very large to handle all the air in the space, especially if your basement is sealed, but they will take the pressure off any filters you use.

If you’re struggling to turn your basement into an airtight sanctuary, air, and recycling should be two of your top priorities. Remember, you may have food limitations, but the air is essential.

Establish Water Sources

Now that your basement is secured and ready for emergencies, the next step is to secure supplies. I will explain this in detail in other chapters. In

most cases, once you're in a survival zone, you want to get out as little as possible. As long as the air is safe, another point to consider is water. On average, humans need a gallon of water per day when saving for survival purposes. Half is used for drinking or cooking, and the other half is used for hygiene needs like cleaning and brushing teeth.

Since the plan is to live off the grid, it's nice to have more options. Eventually, you may need to have water storage for each person in the family.

If you store water for a short period, the plastic bottles or jugs are enough; if it is for a longer time, you should go to chapter two of this book. For a long-term option, you will want something bigger and more cost-effective. It is best to have water in 55-gallon containers or a waterBOB. A waterBOB is a 100-gallon plastic bag created to make bath water safer and more hygienic.

Be sure to treat the water so it is free of impurities. There is nothing worse than being isolated and having a stomach problem because of contaminated water.

Set Up Food Storage

Then, you have food storage. Food supplies are something I will cover in another chapter. Having a supply of food will help you access them without having to go out to the store. From your garden and storage, you have a whole arsenal of ready meals. Canned goods, dry bulk foods, and even freeze-dried foods all need a place in your pantry.

Don't dump all your supplies somewhere randomly. If you stock up for a long life, you'll need a complete inventory and order system. This adjustment is necessary to prevent you from wasting food. As the expiration date of the items approaches, rotate them for consumption at home and put some with a new expiration date. A good shelf can serve to understand the products and keep them in order.

Something to keep in mind is that canned and dry goods are heavy. When you want to organize your emergency supplies, flimsy Walmart shelves aren't the best option. Invest in some sturdy shelves or make your own to make sure they are strong enough to carry the weight. If

possible, stick the shelves to the wall, floor, or ceiling to prevent tipping, especially if you're in areas where it shakes.

Also, remember to have ways to cook off the grid. For example, using a camping stove is not a good idea for a basement, since it is an enclosed space that accumulates carbon monoxide. Cook out or choose pre-cooked or canned.

Insulate Doors and Windows From Heat and Cold

Difficulty: Easy

If our walls are not completely insulated and we notice a lot of noise and cold through them, we can choose to place some laminated plasterboard.

Thanks to the placement of this material, we will be able to thermally and acoustically insulate the room.

Window Weatherstripping

Tools

- Weatherstripping

The Way to Do It

Another important point for heat loss and the entry of cold air into the home is the blind box. To avoid this, special insulators on the market can completely isolate the box. In addition, it is very easy to install, you just need to follow the manufacturer's instructions and that's it.

Insulate Pipe

Tools

- Flexible foam lining

The Way to Do It

The simplest material for insulating long, straight sections of pipe is a flexible foam lining or “skin,” which we will find on the market in different sizes and diameters; this will allow us to choose the appropriate material according to the size of the pipe we want to cover.

The first task we have to do is measure the part we are going to cover and transfer it to the foam block with the help of the flexometer.

We then cut the coating to size with scissors or a utility knife.

Its placement is simple. We open the piece with longitudinal cuts, which in some cases are already made at the factory.

Then we put it into the pipe, wrapping it completely.

To perfectly seal the insulation, we will apply super strong, flexible, waterproof, and temperature-resistant multi-purpose glue around the edges of the opening.

With this flexible foam insulation, we will avoid heat losses and we will control condensation dripping from the pipes.

Waterproof Windows

Tools

- Spatula
- Wet rag
- Masking tape
- Neutral silicone

The Way to Do It

1. Start by scraping the joint between the window and the exterior wall with a putty knife.
2. Then, clean any remaining dust and dirt with a damp cloth. In this way, you prepare the surface to receive the silicone.
3. When the area is clean and dry, apply masking tape to prevent the product from staining the walls. Of the wide variety of paint tapes

on the market, we recommend the one that resists UVA rays and adheres easily to this type of surface.

4. To seal the seams, use a neutral, general-purpose silicone with a brown tint that's great for applying to wooden windows. Load the cartridge with the cannula in the applicator gun and proceed to fill the affected area.
5. Next, smooth the silicone with a finger dipped in soapy water to prevent the product from sticking to our hands.
6. Finally, tear off the masking paper and wait for it to dry for the best results.

In this simple way and for very little money, the joints will be perfectly sealed. And our windows will be perfectly insulated and waterproof.

Door Weatherstripping

Tool

- Weatherstripping

The Way to Do It

You can place this at the bottom of the doors to prevent cold or heat from entering or leaving.

Window Panes

Tools

- Double window

The Way to Do It

Windows are one of the coldest places a person can enter. If you have single-pane windows, you can replace them with double-pane windows to insulate and protect. In this way, we are isolated and better protect the windows of the house.

Long-Term Refuge in Nature

Difficulty: Medium

Tools

- Good location
- Water nearby
- Strong poles
- Thick wood
- Branches
- Mat

The Way to Do It

Suitable Location

Great care needs to be taken when choosing the location of the long-term survival shelter. Where it is placed will determine its duration and whether you can live in this space long enough during the day and rest easily at night.

This is what you should have when you make the selection:

Proximity to Water

Water is the most critical factor in survival situations. If you don't have water, your chances of surviving are reduced. Therefore, when building your long-term survival shelter, it is vital to confirm that you have a water source nearby.

Being able to walk into the water with ease is recommended. Conserving energy is also vital for survival. You don't want to expend too much energy traveling to water sources. Therefore, a good shelter should be no more than 200 feet from a water source.

Exposure to Environmental Elements

Exposure to the weather and environmental elements is another factor to consider when choosing a shelter location. A place with high exposure to the environment and weather can be another pressure on this site, affecting how long it can serve. Before choosing a spot for your shelter, check the area to make sure you are not building in a dangerous area.

Take care of the direction of the wind. Depending on the location and orientation of your shelter, the wind can carry smoke or water into your home or, worse, make it cold, wasting what you need to keep your shelter warm.

Don’t build your shelter near a water source because the water level could rise and flood everything in a matter of minutes.

Avoid setting up the shelter under loose rocks or near cliffs or hills. These areas are dangerous because they are prone to landslides or rock slides where debris can crush you. Lower-lying areas are also prone to flash flooding when rains cause rivers to overflow their banks.

Making a long-term shelter under dead trees can put you in danger. A broken branch, also known as a “widowmaker,” can fall on you at any time. In general, avoid placing your shelter under large trees, whether they are dead or alive. Heavy branches can break and fall in high winds or because they are covered in snow.

Check the area for wildlife. Walk around the area so you can see what kinds of animals live in or near the area. Check animal tracks, scratches, or bones. If wildlife roams the site, the site may not be an ideal space to establish a refuge.

Proximity to Fuel Sources

Just like with water, being warm is vital to your survival. Because of this, you should make sure to build the shelter near a fuel source. You have to be able to keep the fire going without wasting a lot of effort and time walking to keep the wood burning. The fuel source must be close to where you live.

The best place for you to make a long-term survival shelter is on the surface, close to the basic resources you require. It is easier to make

shelters and start fires on level ground. If you can't find flat ground, dig trenches or try to level the ground.

Determine Needs

After you choose a location, it's time to analyze the situation and decide what kind of shelter to build. Are you alone or do you need to design a shelter for a group of people? How long is it going to take you to do it? What is the current average temperature where you are? How's the weather? Are you going to light the fire outside or inside? How long are you going to use it? The answers will guide you in determining the size and structure of the shelter to build.

While these issues may seem minor for short-term shelters, they should be considered if making a long-term survival shelter. If these problems are not addressed, you run the risk of making life difficult for yourself. A little carelessness can put you in danger of hypothermia or dehydration.

Choosing the Design of the Shelter

Like modern homes, long-term shelters come in a variety of designs to choose from. Each design has unique features that can work in different situations and meet diverse needs. According to what is answered about needs and preferences, you can choose the ideal design that best suits what you want. Ideally, long-term shelter designs that take a lot of time and effort are best.

I will show you some of the shelters you can make:

Attached Shelter

Difficulty: Easy

Tools

- 3 long, thick poles
- Thick wood
- Branches

- Mat

The Way to Do It

Attached shelters are one of the most popular long-term shelter designs because they are simple, quick to set up, and do not require a lot of energy to build.

To build your attached shelter follow these instructions:

1. Locate 2 long, thick, sturdy posts for the foundation, spaced 6 to 8 feet apart.
2. Find a thick piece of wood and tuck the branches between the two posts to create an inverted U-shaped frame.
3. Locate and place branches along the frame, lean 45° from bottom to top, and secure with string.
4. Line walls with branches, then gap with extra thick leaves, branches, posts, debris, and bushes.
5. Lay out a mat for you to sleep on or lots of sheets on the floor so you can stay dry.

While easy to build, skinny shelter designs are often one-sided for weather protection. However, it also has disadvantages: when the wind direction changes, the shelter cannot retain heat and becomes ineffective.

Snow Cave Shelter

Difficulty: Easy

Tools

- Snow
- Shovel

The Way to Do It

If your area has snow, a snow cave may be your best shelter. But, be aware that snow caves have potential hazards because if the roof

collapses or oxygen levels are low, you could be left there, dead. To build a safe snow cave, make a shelter out of thick, deep snow.

To build your snow cave:

1. Dig the snow to the sides to create a tunnel.
2. Keep digging to design a platform to rest on, making sure it is level and flat.
3. Create a 6-inch diameter hole in the roof for ventilation.

Quinzhee

Difficulty: Easy

Tools

- Snow
- Shovel
- Sheet or pillow

The Way to Do It

A quinzhee is made from snow. It looks like an igloo but it’s easier to make.

To build your quinzhee:

1. Create a stack and smooth it out.
2. Carefully dig the piles to make a tunnel-like entrance, then dig for a living space. Take into account the thickness you leave on the walls. Thicker walls are more stable and insulating.
3. For ventilation, cut a 6-inch-diameter hole in the roof of the shelter.
4. Design your sleeping pad. You can use pillows or sheets to sleep on (if available). Snow quickly dissipates body heat, so some kind of layer between you and the ground will help keep you warm.

Wicki-up Shelter

Difficulty: Easy

Tools

- Branches
- Leaves
- Shrubbery
- Debris
- Grass

The Way to Do It

1. Creating a Wicki-up shelter is more complex than a semi-detached one.
2. To build a Wicki-up shelter:
3. Assemble dozens of branches that are similar in size and join them to form a sturdy teepee frame. The overall size of the shelter will determine the size of the frame.
4. Once the frame is made, cover it by placing branches, leaves, shrubs, grass, debris, and other vegetation to cover the gaps.

Teepee

Tools

- 3 wooden beams
- Wooden sticks
- Leaves
- Branches

The Way to Do It

Due to its shape, it takes longer to build a teepee. This is a good shelter as it provides adequate ventilation.

To build your teepee:

1. Search for 3 tall, sturdy beams and tied them together at the top.
2. Place the small wooden sticks in the support beams to build the walls.
3. Cover the holes with leaves, branches, and any other vegetation to prevent water from entering.
4. If you're in a warm space, leave the top uncovered so heat can escape through the top. If it's a cold space, seal the top to keep water out of the opening.

Arbor Shelter

Difficulty: Easy

Tools

- Long pillars
- 4 wooden posts
- Branches
- Leaves and bushes

The Way to Do It

The arbor makes an excellent shelter in hot and sunny sites because it offers shade. The shelter has a flat roof that is not waterproof and serves to keep the sun from hitting you.

To build it:

1. Erect 4 long, strong pillars, arranged in a square or rectangle.
2. Find 4 more posts and connect them to the top of the 4 upright posts to form a square or rectangle.
3. Use smaller branches to fill in the top of the shelter.
4. Add leaves, branches, and shrubs to the roof for better sun protection.

Bring Some Comfort to the Shelter

A variety of practices and items can be put in a long-term shelter to make living more comfortable. These additions include:

Add a Fireplace

To keep warm, you may choose to build a fire in your shelter. However, campfires may not be suitable for all long-term shelters, so use caution.

If you want to use fire as a heat source, make sure your shelter has ventilation. It must be high enough to prevent the fire from reaching the ceiling. For vegetated roofs, add cool or damp vegetation, as it is less likely to burn.

If it is difficult or unsafe for you to make a fire inside a shelter, it is better to do it outside. Please be careful not to start a fire too close to avoid burning.

Do Good Maintenance

No matter how sturdy your shelter is, you should have routine maintenance checks. The shelter will be affected by different weather elements every day, which will affect the structure.

The condition of the wood frame, roof decks, and bedding areas should be continually inspected and necessary repairs need to be made. Regular maintenance will ensure there are no surprises when you are about to fall asleep.

Catering

If you plan to stay longer, you should be prepared to have the essentials. These include:

- Water.
- Foods, preferably ready-to-eat canned vegetables, fruits, nuts, meats, dry cereals, dried fruits, rice, canned juices, and any other product that does not require a lot of water.
- All-weather clothing, including sweaters, storm gear, hats, and hiking boots.
- Hunting and fishing equipment so you can gather food.
- Tools like hammers, nails, screwdrivers, axes, shovels, paracords, and ropes to help you build the shelter and repair it.
- A flashlight.
- Matchboxes.
- A blanket and a sleeping bag.
- First aid box.
- Cups, plates, and supplies for you to eat.
- Personal hygiene items.
- Heavy-duty gloves.

Heat the Shelter Without Internal Fire

Another way to keep the shelter warm is to use heating stones. You can pick up stones and set them on fire for hours. Dig holes in your shelter and place rocks in the holes. Warming stones are usually hot enough to warm your shelter overnight.

Building your long-term survival shelter is easy. It does not require special training or skills. Efficacy and stability will depend on the preparations. Once you've decided on your ideal location, considered the needs, and chosen a design, you're ready to have some fun with your shelter.

Chapter 2

Water Projects

Living off the grid implies having projects to access water for consumption and cleaning. Let's see in this chapter the options and how to do them.

Water Sources

To get water from off the grid, you have to locate an available source. It can be a stream or dam on land, groundwater, or rainwater. Not everyone can access a potable stream, especially in residential areas, but rainwater can be collected.

Another benefit of collecting rainwater is that it is pure compared to other options. Unlike surface or underground freshwater sources,

rainwater has no harmful elements, and therefore, does not necessarily require purification before it can be used as drinking water.

Options to Collect

Any house with a roof can collect, store, and divert rainwater for later use. This water can be used for any purpose, including at home, watering, feeding livestock or pets, washing things, or filling a swimming pool. Rainwater harvesting systems are varied in design and function:

- Collection surface: Usually a ceiling.
- Conduction or diversion structure: To channel the water towards the storage system.
- Storage system: Tanks or cisterns that safely store water for later use.
- Distribution system: This carries water to the house, garden, swimming pool, etc.
- Filtration treatment system.

When choosing a system to store rainwater, a safe solution must be found. Tanks must be securely sealed to prevent children or pets from ending up in them, and they must be made of food-grade materials that do not leach harmful chemicals into the water supply.

Rainwater Tanks

Rainwater tanks are popular in residential areas. They are found in a variety of shapes and sizes to adapt them to any corner you have. They can also be chosen in natural colors that blend well with brick wall backgrounds or greenery.

Choose tanks for human use (that is, they are plastic safe), the same applies if you store in smaller containers such as 55-liter containers or even smaller ones that come with handles and look like bricks to store the water for daily use and can be moved easily.

Wells

Wells are man-made holes that protrude from the ground and draw water from an aquifer.

Shallow wells are the most common source of water for off-grid systems. According to the Groundwater Foundation, more than 42 million US citizens use private wells to provide water for their families.

Shallow wells are typically drilled into unrestricted water sources less than 100 feet below ground. Once the hole for the underground source of fresh water is dug, it is brought to the surface through pipes and well pumps.

Ideally, you should build your off-grid home after the well is built to ensure you get the best possible location to access the aquifer.

Rain Barrels

A rain barrel is used to store water, it contains 50 to 200 gallons of water. They are great containers for small outdoor spaces. Multiple rain barrels can be connected for even more storage space.

You'll save money fetching water, and installing your own rain barrels can save even more.

Off-Grid Water Filtration and Purification

Before drinking your first well water, make sure your water is filtered or purified. Filtration systems remove sediment and contaminants to produce clearer, better-tasting water.

Purification systems, on the other hand, remove sediment, pathogens, and minerals. Installing a water purification system is something I'll show you later.

Typically, these are some basic steps:

- **Sedimentation:** Allows large particles to settle to the bottom.
- **Filtration:** Running water that passes through a strainer that filters out the smallest particles.

- **Chlorination:** Puts some amounts of chlorine in the water to kill bacteria.

Some filters remove metals and toxins from the water while working off the grid. They function as water dispensers without the need for pumps.

Feeding Your Water System

You require some electricity to have running water in your home.

Some homeowners choose manual pumping, which involves turning the pump arm to draw water from the well.

However, there are different things you can do to make tap water more accessible. I advise installing gravity-fed water pumps or pipes on off-grid water systems.

Water Pump With Solar Panels

Solar power is becoming an increasingly popular way to generate electricity. Luckily for those living off the grid, it's also useful for pumping water.

Solar water pumps refer to solar panels that convert solar energy into electricity to drive the water pumps. These panels collect light-emitting units that generate current to power the pump motors.

Solar-powered pumps help draw water from wells, divert water to elevated storage tanks, and bring tap water to off-grid homes.

Off-Grid Hot Water

Heating water in a regular electric water heater uses a lot of energy and is the most energy-consuming in your home. A hot water solar system is an affordable and efficient option that, once installed, provides free hot water whenever the sun shines. They are very efficient in a sunny country.

The easiest, cheapest, and most efficient option is to have an evacuated tube solar hot system. They consist of a hot water tank connected to a series of glass tubes, the number varies depending on the size. The water inside the tube heats up during the day, and as it warms up, it moves up the tube to the storage tank. Hot water reaches the top of the tank, while cold water from the bottom of the tank goes into the pipes and is heated by the sun, a cycle that repeats itself throughout the day. While the hot water is pumped from the top of the tank in use, the cold water flows to the bottom of the tank and then into the pipes where it is heated by the sun. No pumps or electricity are required to run the system.

Purification Process

It is better to protect and use safe water sources than to purify water from polluted sources such as rivers or ponds. However, water should be purified if it is believed to contain toxins, if you don’t want to drink it because of taste or appearance, or if it is transported and stored in the

home use (water from pipes, tanks, and wells should also be purified before use).

The method you choose to purify water depends on the amount of water you require, the types of contaminants, how you store it, and the resources available. No matter how you purify it, it's a good idea to either filter the water first or let the water settle and then put it in another container before disinfecting it. In this way, deposits (earth particles) are eliminated and disinfection is easier and more effective.

The methods that I show you below will not make drinking water if the water contains toxic substances. Contaminated water is never safe to drink, bathe in, or wash clothes. It can make you sick and cause rashes, miscarriages, and other health problems.

To eliminate microbes from water, these 2 steps are followed: filter and disinfect.

Filter Modes

Difficulty: Easy

Tools

- Cloth filter
- Carbon filter
- Gross sand
- Chlorine
- Lime or lemon juice

The Way to Do It

As a first measure, let the water stand for a few hours before putting it in a clean container or using it.

Then, disinfect the water in one of these ways:

- Boil.
- Put a few drops of chlorine.
- Put it in the sun.
- Put lemon juice.

How to Settle the Water

As the water settles, mud and other solids—along with microbes and other disease-causing elements—settle to the bottom. By storing water for several days, it will contain fewer microbes. But some microorganisms, such as giardia, will not go away even if the water is stored for a long time, so it is recommended to wait for the water to settle before using another method, such as filtering, adding chlorine, or disinfecting with sunlight.

The 3-Pot Method

Difficulty: Easy

The 3-pot method allows the water to settle, which allows microbes and solid matter to settle to the bottom. This method is safer than letting the water sit in a container, although it does not completely kill the microbes. After using the 3-pot method, the water must be disinfected.

Tools

- 3 vessels

The Way to Do It

1. Day 1, morning: Fill pot 1 with water. Cover and let the water settle for 2 days.
2. Day 2, in the morning: Fill vessel 2 with water. Cover and let stand for 2 days. The soil in vessel 1 is already settling.
3. Day 3, morning: Pour the clean water from pot 1 into pot 3,

making sure not to disturb any sediment in the bottom of pot 1. The water in pot 3 can now be sterilized. The residues remaining in the bottom of pot 1 can be thrown away. Clean pot 1 and fill it with water. Cover and let rest for 2 days (on day 5, it can be drained and ready to sterilize).

4. Day 4, in the morning: Take the clear water from vessel 2 to vessel 3 to disinfect. Wash pot 2 and put water in it.
5. Every 3 or 4 days, you wash vessel 3 with boiled water. If you have a clean soft hose to siphon water from one pot to another, there will be less sediment than if you poured the water.

Use of Plants

In many places, people use plants to make drinking water. Moringa seeds are used in East Africa. In the Philippines, moringa is known as malunggay, in India it is known as a horseradish tree or drumstick tree, and in Haiti and the Dominican Republic, it is known as a benzo tree.

To Use Moringa Seeds

Difficulty: Easy

Tools

- Moringa seeds
- Container to store water

The Way to Do It

1. Let the seeds dry for 3 days.
2. Grind the seeds until they are powder. You will require 15 ground moringa seeds for every 20 liters of water.
3. Mix the powder with a little water to make a paste and put it in the water to rinse.
4. To dissolve the paste, stir for 5 to 10 minutes. The faster you do it,

the less time it takes.

5. Cover the container and let stand to settle the water. After 2 hours, empty the water into a clean container. Let the solids remain in the first container.

Water Filtering

There are many ways to filter your water to remove bacteria from it. Some filters, such as ceramic, require special equipment. Others do not need such equipment and can filter large or small amounts of water before disinfecting.

Cloth Filters

Difficulty: Easy

Finely woven natural filter cloth can be used to remove cholera microorganisms from drinking water. Cholera germs usually stick to small animals that live in the water, so filtering these animals will also filter out most cholera germs. Guinea worms can also be filtered in this way.

Cloth filters can be made from handkerchiefs, blankets, linen, or other fabrics. Old cloth works better than new because frayed fibers have less porosity and filter better.

1. Let the water settle in the container, allowing the solids to remain in the bottom.
2. Fold the fabric 4 times and stretch or tie it around the mouth of another water container or vase.
3. Slowly pour water from the first vase to the second, through the fabric of the second container or vase.

Always use the same side of the fabric. If it is turned over, microbes can get into the water. After using the cloth, wash it and put it in the sun to dry. This will destroy any microbes left on the fabric. During the rainy season, disinfect the fabric with bleach. Be sure to clean the filtered water container at least every 2 to 3 weeks.

Carbon Filter

Difficulty: Easy

This filter is easy to build and works well at capturing most microbes found in the water.

Tools

- 1 hammer
- 1 or 2 large nails
- 2 plastic or metal buckets
- 1/4 bucket of charcoal.
- 1 bucket of coarse sand (not sea sand)
- Filter cube
- 10 cm (3.9 in) opening
- Sand
- 8 cm (3.1 in) charcoal
- 5 cm (1.9 in) of sand
- Sticks to hold the bucket
- Clean collection bucket

The Way to Do It

1. Poke a hole in the bottom of one of the cubes. Clean the bucket, it will now be the filter bucket.
2. Clean the sand by rinsing with water and wringing until the water runs clear.
3. Grind the coal into small pieces. Activated charcoal is best, but charcoal (from regular wood) works too. Never use lump charcoal. It is poisonous!
4. Put a 5 cm (1.9 in) layer of washed sand in the filter bucket and pour water over it. The water should come out of the hole. If it doesn’t come out, enlarge the hole. If the sand runs down, the hole is too big. If this happens, remove the sand and put a thin cloth over the hole, then put the layer of sand in its place.

5. Put a layer of ground charcoal about 8 cm (3.1 in) on top of the sand. Then fill the bucket with sand until it is 10 cm (3.9 in) below the top edge of the bucket.
6. Put 2 sticks on top of the second cube, then place the filter cube on top of the sticks. Put clean water into the filter bucket several times until you see clear water. Then the filter can be used.
7. To use the filter, let the water settle before running it through it. Drinking water remains in a lower barrel. For added safety, disinfect your water after filtering it.

Filtered microbes will grow on the charcoal, so be sure to remove and clean the charcoal frequently if the filter is used daily or when not in use for a few days.

Slow Sand Filter

This is one of the most effective and cheapest ways to filter your water. With this device, you can filter enough water for a small family making about 50 liters per day.

Difficulty: Easy

Tools

- A 200-liter container
- Something to pierce
- Valve or faucet
- Putty
- Hose
- Gravel
- Fabric
- River sand
- Top
- Stone
- Powdered chlorine

The Way to Do It

1. Clean a 200-liter container such as a plastic bucket or a water tank and disinfect it with powdered chlorine. Make sure the container has not been used to store toxic substances.
2. Drill a hole 1/3 of the way from the top of the container for the valve or faucet. The diameter of the hole must be the same as the diameter of the tap (for example, if the diameter of the tap is 12 mm, the diameter of the hole should also be 12 mm).
3. Put the faucet in the hole and secure it with hardened putty. If you have a brick container, you can cement the valve or faucet to the wall of the container.
4. Prepare the collection hose by drilling many small holes with a drill or nails in the first 35 cm (1.1 ft). Seal the end of the hose, and place it in a circle at the bottom of the container, with the drilled holes facing down.
5. Connect the other end of the hose (the one without the hole) to the faucet. Seal the fittings with clamps or wire.
6. Put a 7 cm (2.7 in) layer of clean gravel in the bottom of the container and cover the collection hose. Cover the gravel with a cloth and fill the container with clean river sand up to 10 cm (3.9 in) below the tap. Then cover the sand with another thin cloth.
7. Make a lid for the container with a hole to pour water into. Place a flat stone or plate under the hole to prevent the sand from shifting when you pour the water.
8. Rinse the filter well with water. Once the filter is clean it is ready to use.

These are some ways to prepare water, whether you make it with a well, rainwater, or take it from a river, filtering is important and it should be as pure as possible. Speaking of water, in the next chapter I will show you how to heat it for consumption and use.

Chapter 3

Water Heating Projects

Living off the grid is all about building systems. You have to work on having a water heating system.

We are used to hot water just by turning on the faucet, but this wonder has not existed for a long time in human history. The first gas water heaters were made in the 1890s and did not become widespread until the 1930s.

Propane Water Heater

I find that propane water heating is the method with the best balance between living off the grid and enjoying convenient comfort.

While propane isn't completely off the grid as you have to rely on another entity to supply you with that fuel, it is a very efficient way to heat water and is used by many people who are off the grid.

Propane tankless water heaters are easy to buy and inexpensive. Many rural communities have it at home and have a large propane tank that they fill up when the gas runs out. They also take the propane tank to the store for refills, but that's less convenient.

Unfortunately, as the demand for natural gas goes up, propane gets more expensive, especially during the winter months. However, it offsets this cost by using less hot water.

An easy way to reduce hot water use is to turn off the water intermittently when you shower.

Propane Tankless Water Heater

These types of heaters have become very popular due to their low-consumption design and having hot water on demand.

When you use a tankless water heater, you have constant water. This is because it is instantly heated by the superheated coil compared to traditional water heaters where the water sits there warm and stored. Since these types of heaters are in demand, it uses less energy because the unit only heats water when it is in use.

These types of heaters last nearly twice as long as the traditional ones and often come with a solid multi-year factory warranty.

Please note that unless you are a licensed gas plumber, professional installation is required.

How Much Propane Does an Indoor Propane Tankless Water Heater Use?

Several factors determine how much propane the tank will use. The water heater heats up to 120 degrees Celsius. The number of BTUs required to reach this temperature will largely depend on the location. This is the groundwater temperature.

North America can be taken as an example. It takes about 650 BTUs to heat a gallon of water averaging 42 degrees Celsius with a tankless

propane water heater.

The average person in the US uses 12 gallons of hot water each day.

Multiply your BTUs by gallons:

650 BTUs X 12 gallons = 7,800 BTUs per person per day

Then calculate the number of BTUs in a pound of propane: that's 21,548 BTUs and divide by the BTUs per gallon of propane for daily use:

21,548 / 7,800 = About 3 days of use per person, per pound of propane.

Using these calculations, 1 pound of propane provides 3 days of hot water per person.

This number can change based on your location, seasonality in water use, who lives, how many appliances require hot water, and how much hot water each uses. So, take a moment to estimate your hot water usage to determine if a propane tankless water heater is ideal for off-grid living.

Indoor vs Outdoor Propane Tankless Water Heater

When you want to place propane tankless water heaters, you will see that there are models for indoors and outdoors. The key difference is that the outdoor models do not require ventilation because they are placed outdoors. However, if you buy an indoor model, you have to properly vent the water heater, which means drilling holes in the wall.

Another factor when choosing an indoor or outdoor water heater is condensation. The heater not only requires ventilation, but it must also drain condensation, which translates to an additional hole in the wall.

Outdoor propane-free water heaters are vent-free and cheaper than their indoor counterparts.

However, outdoor water heaters require more propane to heat the water in icy areas, especially in winter. It could freeze the drive and cause irreparable damage.

Assuming you build a new house and you are in cold weather, it's logical to think about placing a tankless indoor water heater. Outdoor heaters make a lot of sense if you are adding a tankless water heater to an existing building and live in a more temperate climate.

Solar Water Heater Systems

Heating water with solar energy is completely free and very efficient. You will be surprised how hot the water gets under the sun. I'm sure you've experienced super hot water coming out of a hose that's been out in the sun all day. Imagine if the hose were black, it would get even hotter!

A good example of solar hot water comes from Israel. Up to 85% of citizens use a "dud shemesh," or solar boiler, a simple device that heats water-filled panels in direct sunlight. The heated water then circulates to the tank by convection. Despite efforts to improve energy efficiency, less than 1% of Americans use solar water heaters.

Solar collectors circulate hot water in sunlight through pipes, which then route the heated water to your existing water heater or a special water heater built just for this system.

These pre-built solar collectors can be very expensive and some require professional installation.

For some systems, you can put them yourself and connect directly to the hot water system. The benefit of these systems is that there are no moving parts to break, so the unit is maintenance-free.

Building a Do-It-Yourself Solar Hot Water Collector With a Holding Tank

Difficulty: Medium

To make a solar water heater, you need key components, such as a collector to gather solar energy, insulation so you don't lose much heat, and a tank to store hot water.

First, you create the collector. You'll want to mount metal or glass panels to the frame, put some insulation on the back and sides, and angle it just right to let in as much sunlight as possible. Then you lead to the storage tank. Don't forget to wrap some insulation around the tank so the heat doesn't escape. Also, store the tank indoors or make a small insulated enclosure around the tank to prevent heat from escaping.

Finally, install a system to circulate the water between the collector and the storage tank. This can be done using a pump or gravity. If you want to use gravity, use a convective process.

Convection occurs when water is heated. As it warms up, it carries heat up, creating a continuous flow cycle. The tank has to be placed on top of the collector so that the hot water rises and is collected.

Tools

- Metal or glass panel
- Used and broken traditional heater
- Black paint
- Brush
- Wooden frame
- Reflectix
- Hose

The Way to Do It

Don't want to spend thousands of dollars on a solar panel heating system? You can make one yourself for a few cents!

The method is very simple:

1. Find a used and broken conventional water heater. You can find it for free at local landfills, building supply stores, and electrical stores.
2. Remove all bits and pieces until you are left with an empty tank.
3. Paint that tank black.

4. Put the tank in a wooden frame lined with Reflectix panels. Place a glass panel on top; you can use a piece from an old window or sliding glass door.
5. Attach the hose to the water tank and fill it with water. Attach the removed outlet hose to your existing water heater.
6. Let it heat in the sun and you will have piping-hot water!

DIY Water Heater

Difficulty: Easy

Tools

- 30 plastic bottles
- 12 meters of hose for irrigation, black, ¾ inch
- 8 union T
- 2 fittings
- 1 Teflon roll
- 2 ¾-inch ball keys

The Way to Do It

1. First, with the help of a serrated knife, patiently drill a hole in the bottom of the bottle with the same diameter as the cap. Do this process in the 30 containers.
2. Cut 5 2-meter (6.5 ft) pieces, one bottle after another, this means that the bottle opening will enter the perforated bottom of the next container to form a row of 6 bottles.
3. Then, insert a hose and repeat this step 5 times; after using 30 bottles and having a grill, you are ready to put fittings on both ends and a “T” in the middle.
4. After completing the above steps, please put it in a sunny place near the water tank with a slope of 45%.

Electric Heaters Used Off Grid

As someone who has been in the process of living off the grid for a while, I've caught big changes in the world of heaters. One development that excites me is the improvement in electric tankless water heaters. When I started going tankless, they weren't an option for off-grid use because they required a lot of electricity. But these days, they're more energy efficient, making them a viable option for those of us living off the grid.

These new tankless electric water heaters use less energy, plus they provide a constant flow of hot water, so you don't have to worry about running out of water when bathing. And since they don't have a tank, they take up less space, making them a great choice for those with limited areas. Plus, you don't have to worry about the tank, you'll never have to deal with the hassle of replacing a rusty or leaking tank.

Tankless electric water heaters are a good option for small hot water uses, such as in a machine room, or if you have panels and use electricity from them.

Calculating the Consumption of a Tankless Electric Water Heater on an Off-Grid Battery Bank

Before you decide to install a tankless water heater at home, carefully calculate the size of the battery pack you need to support the electrical consumption it requires.

For example, we will see the electric tankless water heater that has about 13 kilowatts of power at 240 volts.

Number of batteries = Total power consumption in watts / (Battery voltage x Battery capacity in Ah)

For example, for a 12 V battery, the number of batteries can be estimated as follows:

- Number of batteries = 13,000 watts / (12 volts x 100 Ah)
- Number of batteries = 13,000 / 1,200
- Number of batteries = 10.83

So, you need at least 11 100-Ah batteries to support a consumption of 13 kW.

At this time this only includes the battery. An electrical infrastructure is also needed to ensure that this solar energy system does not explode.

I'm not an electricity expert and I have a hard time understanding my solar installations, so I can't give you clear infrastructure advice on an off-grid electrical procedure to make a tankless electric water system easy. However, once upon a time, water heaters with the high-efficiency features sold today did not exist. So, for anyone interested, this is an option!

Mini-Tank Electric Water Heater

You can also take a look at one of these mini electric water heaters for sinks and small water heating installations.

These mini-tank water heaters have a hot water capacity of 2.5 to 7 gallons and a heating power of 1400 watts. These can be used in a stateroom, installing one for the galley and one for the bathroom.

More than 2 point-of-use heaters can add a large electrical load if you are not careful when running the hot water.

It uses 13 kW of electricity, which is still plenty, but it's much less than the previous generation of electric tankless water heaters; and there's even a smaller option that uses just 8 kW.

Solar-Powered Traditional Electric Tank Water Heaters

You can use a conventional panel-fed electric water heater for off-grid installations if you do the math at the time of installation.

It is important to consider the size of the electric water heater and the configuration of the panels to ensure there is enough power to heat the water safely. The right size system will provide consistent hot water power even when the sky is cloudy.

Although traditional electric tank water heaters may not be as energy efficient as tankless models, they offer a convenient and reliable source when using solar power. With the bonus of storing hot water for later use, it could be a practical option for those living off the grid.

Calculating the Amount of Solar Energy

A water heater uses 4000 watts per day and can work for about 3 hours per day.

When the sun provides about 4 hours of direct sunlight per day, a 250-watt solar panel will provide 250 watts per hour, which is equivalent to a production of about 1,000 watts per day.

You have to divide the daily power of the water heater by the power provided by the solar panels:

4000 / 1000 = 4 250-watt solar panels.

You should also make sure that the battery pack can deliver 4000 watts. It is an approximation, if you have a 12V system and you want to discharge the battery to 50% capacity, it takes about 8 x 100 Ah batteries in parallel to support 4000 watts of power consumption for a few hours.

In summary, there are several options for off-grid hot water heating systems, each with its pros and cons. Whether you want a concentrating solar water heater, a wood-burning system, a tankless electric option, or a traditional solar tank electric water heater, you'll need to carefully consider your needs, budget, and available resources.

Keep in mind that your goal is to have a useful and efficient hot water source that meets your needs at home. Take the time to research, compare, and find the right solution for you. Do not fear to call a professional for advice and help with installation, especially when it comes to electric and gas appliances.

In the end, you'll be glad you did because there's nothing like a hot shower after a hard day on the property.

Chapter 4

Energy Projects

There are several ways to generate your own electricity, some are well-known and used all over the world, while others are not so well-known. The different methods I am going to show you here can be built on a smaller scale for everyday home use. They are solar, wind, and micro hydro.

Solar Energy

Solar energy converts sunlight into energy that produces heat or electricity. To generate electricity from the sun, a specific technology called photovoltaics is used. It is when solar panels serve to absorb sunlight and then transform the energy into electricity.

It is a well-known way of generating electricity that is increasingly being adopted in fields, buildings, and for those who live off the grid. If you consider installing solar panels at home, remember that sunlight is not constant. Depending on where you live, it can take a lot of space to collect light and convert it into enough energy to power everything you need.

Wind Power

Wind power uses wind turbines to generate electricity. The wind sets the blades of a wind turbine in motion, which rotates with a generator to produce electricity. Wind turbines are one of the simplest options for you to generate your electricity. There are different sizes, it all depends on your energy needs.

If the idea of using wind turbines for off-grid electricity generation appeals to you, the wind in your area is something to consider. You can find wind information by asking local weather stations and airports. Another tool that can be used to determine if the wind volume is worth the investment is the state wind map.

Micro-Hydro System to Generate Electricity

Micro hydro is a method of generating electricity by converting the energy produced by a body of water moving such as a current. The water flows through a turbine, which is connected to a generator that produces electricity.

Micro hydro systems only work if there is a moving body of water near where you are going to feed it. Running water in a constant flow is a very reliable source of power, but depending on where you are, it can be a seasonal resource. Even if you have running water, you still have to do your work. You will need to know if your stream has enough water and is moving fast enough to convert sufficient energy to have an impact.

If you think you have the perfect site for your micro-hydro system, look up information on it for the next steps.

Note: One thing to keep in mind when considering electric alternatives is that they rely on natural elements (sunlight, wind, water) for power. You have no control over these natural events, and they are not always cooperative. The best way to prepare yourself is to have a backup generator on hand.

Solar Energy Is the Best Option

There are many benefits to putting up your solar panels. For better understanding, I have broken down the following points for you to read.

Solar Panels Are a Renewable Green Energy Source

The dangers of climate change have become increasingly apparent over the past two decades. Life on our planet is at risk and we all feel the pressure to change our habits and live more ecologically.

It's a great way to generate your own clean, renewable energy from the sun, and that's what solar panels give you!

Solar systems do not produce harmful emissions and do not require fossil fuels to function.

If you're looking for a greener way to live, solar power is a great place to start.

Solar Panels Help You Save Money

Greener living isn't just about saving the planet, but also about saving money by living off the grid. Generating your electricity means less dependency on the grid. You can reduce your electricity bill or eliminate it. The initial investment can be large, but over time you will start to see financial benefits.

Grid electricity prices are likely to continue to rise as the global supply of fossil fuels dwindles and unpredictable geopolitical situations, not to mention natural disasters exacerbated by climate change. At the same time, aging electrical infrastructure makes the grid less reliable than ever.

With prices falling rapidly and solar technology improving, now is the perfect time to take the plunge.

Solar Panels Can Be Easily Installed

Setting up your solar panels may seem like something titanic, but it is not. You can install your solar system at home!

I will walk you through a step-by-step DIY solar installation. Home renovations shouldn't be stressful, and installing solar panels doesn't have to be either.

Solar Panels Are Low Maintenance

Solar panels can be installed relatively easily, they do not require much maintenance. Once they're installed on the roof, you can forget about them. Solar systems do not require refueling and last a long time. The guarantee they offer is 25 to 30 years. These panels are designed to be used a lot with little to no maintenance, other than wiping them down from time to time. You may need to clean them more, once a year, but rainwater usually takes care of that.

Considerations Before Installing the Panels

Now that you know why solar panels are a great idea, you're probably considering installing them at home for off-grid living.

You don't want to spend on technology that does not meet what you need for power generation or place the wrong equipment. Carefully consider the following factors before you purchase panels.

Your Location

The location has nothing to do with the amount of sunlight it receives each day. Peak times of the day have an effect, but even in low light, solar panels can harvest energy. You don't need to live in the desert for your solar panels to generate enough electricity.

However, if your roof is placed in a lot of shade, you will not have the same benefits as solar panels receiving direct sunlight.

Dig a little deeper into the average amount of sunlight in your location, and take into account things like shade. It pays to know what the investment is worth before you commit.

How Much Energy Does Your Home Use?

Several factors can affect your home's energy consumption. The number of people, the number of devices you have running at the same time, and the size of your home all play a role. Before you buy a solar power system, be sure to look at your home's electricity use, specifically the wattage of basic equipment and appliances.

Doing the math will give you a better idea of how much a switch to solar power could benefit you!

The Condition of Your Roof

Solar panels do not usually damage the roof, but they do add additional weight to the structure. This is because they are normally mounted with panel hooks or a similar device.

If your roof has not been inspected for a long time or it looks worn (rot, moths, rust, etc.), maybe it is not the best time for you to put panels on it, better hire experts to check the roof and then invest in the solar power system. The last thing you want is to spend money on a set of solar panels only to find out that your roof might collapse. Also, portable solar panels are a very viable option. You can put them in the backyard and take them with you.

Choose a Good Brand

Finally, but perhaps best, consider which manufacturer you will be purchasing the solar panels from and the system that converts and stores the electricity.

Not all brands are the same, just like panels, reputation matters! Always do your research on brands that appeal to you before paying. You may think you're on a bargain, but if you buy low-quality technology, you may need to replace it sooner than you'd like.

Shop smart!

Installation of Solar Panels

Difficulty: Medium

Tools

- Current clamp
- Multimeter
- Grounding tester
- Nose pliers
- Densimeter
- Strippers for cable connection
- Welder
- Drill
- Crimping tool for MC4 terminals
- Protective glasses
- Protection helmet
- Protection gloves
- Vest
- Life wires
- Dielectric shoes
- Everything included in the solar energy kit that you purchase
- Carefully read the manufacturer's manual

The Way to Do It

Now let’s start with the installation process.

In terms of installation, the different brands of solar panels look alike. But there are also some unique differences. This step-by-step guide will show you a general way but it should still work for you to install. If you think it beats you, I recommend hiring experts.

Connect the Solar Panel Supports

Once secured on the roof, the first task to do is to secure the solar panel supports, the pieces where the panels will rest and “hang,” so they are stable and face directly where the main source of sunlight arrives during the day.

Also, consider how to maximize sun exposure at all hours of the day. Set the frame at an 18 to 36-degree angle on the side that receives the most natural light.

Secure Solar Panels in Place

Once the supports are firmly in place, the panels can be installed.

You can find rigid and flexible solar panels to mount on the roof or ground. No matter how sloped or unusual your ceiling is, putting it in place should be easy.

Make sure all the nuts and bolts are on to secure the panel. This will ensure they stay exactly where they fit, no matter the weather.

Connect Solar Panels to an Inverter or Portable Power Station

Next, wiring. It is the scariest thing, but in reality, it is a more or less simple process. Much of the MC4 cable connectors are used, because they have compatibility with all kinds of solar panels. Only try this when the home power is completely off, or you’ll risk an accident.

Install the Solar Inverter or Use a Portable Power Station

The inverter converts the sunlight absorbed by the panels into electricity that can be used and stored. Portable power stations and solar generators

have built-in inverters and all it takes is a true plug-and-play solar system.

In general, the inverter should be installed near the main distribution board, which must be in a cool space. If you choose to install your solar inverter outdoors, don’t hit it with direct light.

Connect the Inverter to the Consumer Unit

Finally, connect the inverter to the consumer unit (fuse board). You must connect solar cells to the consumption units for the storage of the electricity generated. The energy meter with a little screen tells you how much energy the solar panel is producing. Some systems even come with an app, where you can see everything from your mobile.

Your solar panels should always include a detailed manual for you to install with its parts. If after seeing this and seeing what the manufacturer includes you still have doubts, contact an installation expert.

Do I Need Permission to Install Solar Panels on My Roof?

In most cases, no, you do not need to apply for planning permission to install solar panels on your roof. Generally, permitted development is kept in mind that should not impact neighbors. After all, you are not increasing your fortune. You only add to what already exists.

However, some exceptions may apply depending on where you live and local regulations, in particular, if you do not comply with the following:

- Panels rise more than 8 inches (200 mm) from the ceiling
- Your house is an emblematic or listed building
- You are located near a listed or emblematic building

Check local and national guides for details regarding your home. In many places, you just begin to install.

Installing solar panels on your roof may seem like a daunting task, but it can be worth it.

Not only will you become energy independent, but you'll also do your part for the environment and save on utility bills in the long run.

Consider buying your solar panels today and see why so many people and businesses are turning to this alternative.

Do Not Exceed 100 Amps for Solar System

There's a good reason most modern solar charge controllers can't go above 80 amps. Using something higher would cause too many problems/dangers.

If you make a mistake with a current this high, you could seriously injure yourself and possibly burn your property. Also, most of the solar cells you'll use in off-grid systems don't provide high currents like your car's starting batteries. They are just different.

Therefore, if the solar system requires more power, I advise you to increase the total voltage, for example, from 12V to 24V to 48V.

Do Not Invest in Solar Panels With Solar Tracking

Tracking systems are undoubtedly smart technology that increases the amount of energy produced.

But you get more if you invest in placing more solar panels than in a single solar tracker. Also, keep in mind that solar panels can sometimes last more than 25 years. The main reason is that there are no moving parts involved.

However, a solar tracking solar panel is a mechanical system that requires more general maintenance to function properly.

Mobile Solar Power

There are different types of portable solar systems to choose from. Each one has a different purpose.

Solar Powered Portable Battery Charger

These devices contain solar cells and batteries. They usually have a flashlight, maybe a compass, and can also be charged with a power cord. These solar chargers have USB ports to power phones and other electronic devices. Some solar cells are capable of charging a phone multiple times and are affordable, while others are larger and more expensive.

Portable Solar Panel Kits

These setups cover one or more portable solar panels, a battery combo, and a charge controller that regulates the charging of the battery. In addition, a series of portable solar panels with a support or frame to support the photovoltaic panel at the angle that is wanted. Solar panels typically have high-efficiency monocrystalline solar cells that can generate more power in a limited space than polycrystalline solar panels.

Solar Power Generators

Just like generators use fossil fuels, solar panel generators offer you off-grid power when you need it. In recent years, a variety of models have

come onto the market, giving buyers more options to get some power anywhere the sun shines. Sometimes solar generators are sold in kits that include solar panels, and other times the panels are sold separately.

It is interesting to find out the number of loads that will be fed to know how to size the solar generator accordingly. For example, you might want to plug in your refrigerator always or every few hours to prevent food from spoiling. Unfortunately, batteries start to degrade a bit over time and their charge stops being the same, so plan accordingly. Some solar generators do not weigh much, which makes them more portable.

Let’s look at the positive aspects of small-scale solar panels.

Lower Initial Cost

There are plenty of DIY solar kits and solar panels for you to take with you. Although there are prices to suit any budget, they often cost much less than installing systems on the roof. Therefore, it is a great way to get started in the world of panels without leaving several thousand dollars in investors, systems, and labor. Also, since solar panels are not placed on the roof or connected to the electrical panel, a professional solar installer is not required.

It also happens that financing can be obtained through retailers. This helps make them available to more people, including those who don’t own their homes but may incur interest charges.

These solar systems usually contain batteries that can be charged in the sun or sometimes by connecting to wall power. This means you may have power while you are leaving the house, walking in other areas of the shelter, or being caught outside the home by surprise. Portable solar products are great for preparing for disasters.

In other cases, electricity is available but can be very expensive. For example, some campgrounds have high electric bills and campers can save money by using a portable solar unit or have more flexibility in where they park if they don’t need to park near an electrical outlet.

Of course, not everything is rosy:

While ideal for mobile power, these systems don’t offer all the benefits of rooftop solar systems.

Durability

Rooftop solar systems, as I said before, can last 25 years or more and often come with good warranties. Solar panels often have frames and a mounting system that securely fastens them to the roof. By contrast, portable solar panels usually come attached to a mount and are typically waterproof, but can struggle in heavy rain. Also, since they are not connected, strong winds can damage them.

Because they don’t last as long, portable solar modules have a shorter warranty than roof-mounted solar systems. For example, some well-known brands offer a 2-year warranty, while others offer 10 years, it all depends on the manufacturer.

Residential and commercial solar systems are eligible for federal solar energy tax credits. However, portable solar systems are only occasionally eligible for solar tax credits. So if your RV is your primary or secondary residence and you buy a portable solar system for it, you may be able to claim a tax credit.

While there are many portable solar options available, they may not be right for everyone, and they serve different purposes than home solar panel systems. A rooftop solar system or community solar subscription is a better option if you want to drastically reduce your home’s electricity bills. Portable systems are ideal if you need emergency power or solar power on the go.

Before you buy the system, consider your energy needs and the advantages and disadvantages of each option. Calculate the electrical loads you will have and make sure how long it will take the solar cells to power them. If you are going to use a portable solar system for camping or hiking, make sure it is light enough.

Chapter 5

Food Projects (Production and Preserves)

The first step for food projects is for you to preserve, produce, and know how to store. Before doing so, as in the previous chapter, you have to calculate the number of people who will eat, quantities, and needs.

Use an online food storage calculator to find your family's food supply for 2 weeks, 1 month, 2 months, 3 months, 6 months, or 1 year. Use it to find out the minimum amount of food storage required to feed all household members. Include food storage recommended for grains, canned or dried meats, fats and oils, legumes, milk and milk products, sugar, fruits, vegetables, water, and other essentials to make the recipes. These figures are minimum servings and may be increased to accommodate specific individual and family needs. You must select the best food for your family.

The average woman needs to eat about 2,000 calories a day to maintain her weight. And the man needs 2,500 calories for his daily need. Other factors to consider include age, height, current weight, activity level, metabolic health, and more.

When building long-term food storage, buy foods with a long shelf life (for example, flour, rice, sugar, and freeze-dried foods) and learn to keep your food using various methods, because variety can be added to food. Store and give yourself more options if there is an emergency or crisis. In addition, learn what factors affect the shelf life of food and how to extend it.

What Foods Can You Store?

- Food bought in bulk
- Freeze-dried food
- Rice
- Sugar
- Wheat grains
- Flour

Installing food storage can be expensive, so you can prepare yourself financially by shopping around for cheaper, taking advantage of deals at bulk food stores close to home, or looking for the best locations to get good prices.

Methods for Preserving Food

- Freeze drying: You can consider whether purchasing a freeze dryer is right for you or if you can look into other options.
- Canning: You are able to can a series of foods at home, just by vacuum sealing them with a system similar to a bain-marie.
- Dehydration: You can also dehydrate food with home methods.
- Freezing.
- Vacuum packaging of food.
- Plus, there’s the option to store non-perishable foods like wheat berries.

It is crucial to start first and build the storage bank for a long time. Viewing daily food and regular meals you can put down for 1 to 3 months from a rotating pantry of food and ingredients.

Do not forget that the drinking water that we saw in the second chapter is also necessary and you must have one to two gallons per person daily at least—and this at survival level—so make sure you know how much you need, how to store large quantities, and how to choose the best emergency water filter.

Grow Food Storage

Emergencies are not expected, they are unpredictable, so it is important to analyze the most likely crises or emergencies in your area and develop a response plan.

Food Storage Containers

There are many good options for long-term and short-term food storage containers. My advice is not to worry too much about the containers you need to take, and only ask for a few so you don't delay stockpiling emergency food supplies your family may soon need.

The Process for Calculating the Amount of Food

Here's how to do it: Step by step to make it easy.

1. Take your people's favorite food.
2. Write down the recipe and multiply it by 12 (leaving a year's worth of that food if the plan is to eat it once a month).
3. Buy enough items to supply the pantry for a year on that recipe.
4. Repeat the process for the next meal.

Storing and Rotating Your Food (FIFO: First In, First Out)

It is good to rotate the food in the pantry, consuming the oldest first and leaving the freshest, changing every once in a while what has dates greater than two months from its expiration date.

Canned Foods

Storing and rotating canned goods can be challenging. With canned goods, a FIFO (first in, first out) approach can be confusing. To combat this, I have found that having a good can organizer and rotator is very helpful, even indispensable. Found a cheap and suitable shelf where you put the products and they rotate, which facilitates the FIFO.

Emergency Food Storage

In addition to long-term food storage, you should include the preparation of a 72-hour emergency food kit. This food only requires water to prepare it. It can be purchased in pre-packaged servings or bulk. Ideal for storms, power outages, disasters, and more. Having this 72-hour emergency food supply when stores are closed is a good idea. Make sure you have one of these emergency products in your home. Keep it in the shelter or car.

Freeze-dried foods are a great way to preserve fruits and vegetables; you should have your supply of emergency food and meals for camping or backpacking.

Tips for Long-Term Food Storage

- Food and water must be rotated every 6 to 12 months and you must have an entry and exit control, writing down in an agenda with a pencil or pen and your own code so that nothing expires.
- Store canned goods in a cool, dry space between 40 and 60°F to prevent spoilage.
- Store food in airtight containers to guard against insects and rodents.

- Don’t eat canned goods that with swollen, dented, or corroded containers.
- While there’s a power outage, eat first from the fridge, then from the freezer, and then from the bottom of the pantry. In a well-insulated refrigerator, food will usually keep for 2 days if ice crystals remain in the center of the food. Keep the refrigerator and freezer doors closed as much as possible.
- Consider investing in a generator for the food in your freezer and refrigerator to keep those foods from spoiling.
- Make sure the refrigerator temperature is below 40°F. If the refrigerator is not turned on, the food will stay cold for about 4 hours.

Preparing Preserves

Pressure canning is a safe method of placing low-acid foods (foods with a pH greater than 4.6). All vegetables, meat, poultry, and seafood fall into this category. Due to the risk of botulism, these foods must be packed taking care that no oxygen remains inside.

Can the potatoes be canned?

Potatoes are not as acidic and must be canned using pressure canners or a water bath. Canning provides the high amounts of heat needed to kill the bacteria that can cause botulism.

Fruits high in acid, like strawberries, are perfectly safe without adding any sugar. The problem is that packing them directly in water means that the sugar and flavor leach into the water, which takes away the flavor.

Canning Food

Difficulty: Easy

Tools

- Jars that seal hermetically
- Cooking pot

- Food to introduce

The Way to Do It

The bain-marie is a way of cooking and a way of conserving.

It is about placing the container with the food to be processed in a cooking pot with water under heat so that it is not the heat of the direct fire that affects the food but the heat of the hot water.

Fruits, tomatoes, pickles, and jams are foods with an acidic pH or high sugar content that you can keep with good results and for a long time.

If we sterilize cans of tuna or sardines in oil in a bain-marie, the time must be increased and then refrigerated so that we do not take unnecessary risks.

The way to do it is the following:

1. Thoroughly clean the jars you are going to use, as well as the lids. Mason jars with metal lids are perfect, and old mason jars with lids intact also work well.
2. You can clean them perfectly using the hot water program of the dishwasher or you can put them in boiling water for a few minutes.
3. Fill them with the food you are going to preserve.
4. Fill the spaces between the food with the syrup, oil, or liquid you want, depending on the conservation in question, so that there are no air pockets and the food is covered by the liquid, but leaving empty a centimeter from the jar and the edge.

This free space is important because it does multiple things:

1. It allows the food to expand as it heats to prevent the jar from bursting.
2. The air heats up and expands, flowing up and escaping through the seams of the lid.
3. As the lid cools and shrinks, a void is created to prevent bacteria from entering.
4. If you see air bubbles between the food and the liquid, prick or

squeeze with a spatula or fork to expel the air bubbles.

5. Tighten the lid to cover the jar.
6. Chose a pot or pan tall enough to hold a jar upright and is fully submersible.
7. Put a cloth in the bottom of the pan so that the jars do not collide with each other. Put the jars (ideally they should be the same size) and cover them with water so that it exceeds the jars by at least 3 cm (1.18 in).
8. The water should cover the jar well so that when the cycle boils, the heat of the water is even across the entire surface of the jar and lid.
9. Put it on the fire and let it boil for the number of minutes specified in the recipe (at least 30 minutes from the boiling point, or about 45 or 50 minutes in the case of fish). If the jar is big, it will take longer.
10. When the cooking time is over, remove the pot from the heat and let the jars rest in the water for about 10 minutes so that they cool down a bit and we can pick them up without burning ourselves.
11. Take them out on a rack or a kitchen towel, place them vertically and separated from each other, and let them cool completely. Do not move or manipulate them so as not to damage the sealing process. They can also be left in the water to cool completely without moving them.
12. Once cooled, check that the lids are well sealed (you will see that they bend slightly inwards).
13. Finally, label them and store them in a cool and ventilated place, or the fridge if there is room.

As I already said, if it is fish (skipjack or sardines in oil) that is being preserved, refrigerate it and eat it within a few months, since all precautions are good.

Jar Sterilization

To this day, the fastest and easiest way to do it is with a pressure cooker:

1. Place a piece of cloth in the bottom of the pot, put the jars on top, and space them out with more cloth so they don’t collide.
2. Fill the pot with water up to 2/3 of its capacity, cover it, and put it

on heat.

3. Leave it for 10 minutes (5 minutes in a fast pressure cooker) when it reaches full power.
4. Let the jars cool in the pan.

Dehydrated Foods

Some foods can be properly prepared before dehydration. Dishes like stews, chili, and risotto are great on the dry down.

Tips for preparing dehydrated food:

- Spread everything out thin and even, tossing it on the pan from time to time to make sure it's completely dry.
- Most foods can dry at 135°F for 8 to 10 hours. Just make sure no moisture remains and break up any clumps of food as it dries.
- If the food includes cheese, such as risotto, add it only after rehydration.

That's it.

Recipe: Dehydrated Tomato Sauce

Difficulty: Easy

Canned or homemade tomato paste can be spread on parchment paper, then turned into tomato skin and reconstituted with hot water.

The amounts are to taste.

Tools

- Blender
- Tomato
- Parchment paper

The Way to Do It

1. Choose a sauce without tomato chunks, or use a blender to puree it. Beware of creamy or cheesy sauces.
2. Place the sauce in a thin, even layer on top of parchment paper.
3. Dry at 135°F for 6 to 8 hours. Flip at 5 hours or so when the sauce can be easily removed. (This is optional to increase the drying process, but the sauce can dry without flipping.)
4. The leather should be smooth without sticking. Cut into small pieces to make it easier to put back together.

Dehydrated Food Storage

Dehydration is key for food to last a long time and not oxidize.

Dried fruits can be properly stored for a life of 5 years and vegetables up to 10 years. If you eat food other than meat in a year, put it in freezer bags or reusable airless storage bags. For long-term storage, vacuum sealing with an oxygen absorber is best. Keep the food in a cool and dark place.

Meat and seafood that are going to be consumed within a month can be left in freezer bags and put in a cool, dark place; otherwise, it's best to freeze them in a vacuum seal. Meat stored properly in the refrigerator will keep for up to a year.

Apply common sense: Don't eat what doesn't look healthy and smells bad.

How to Prepare Dehydrated Meals

Now we have the best: The preparation of the food. Get creative and try different flavor combinations.

- Fill the dehydrating ingredients with store-bought. For this, consider adding items like powdered milk and sauces, ready-to-eat mashed potatoes, spices, and cheese. You can put oil in squeeze bottles for more flavor and calories (a common trick among hikers).

- Reusable and vacuum-sealed storage bags are ideal for storing single-serving meals. Label the type of food and the amount of water needed to rehydrate later (most foods require the same amount of water per serving). If you already have it ready, put a paper towel in the bag first so it doesn't leak through.
- If you have ingredients with a high moisture content, like fruit, put them in separate bags inside the main food bag to prevent other ingredients from getting soggy.
- A normal serving for dinner is about 1 cup of dry food. Increase to 1 1/2 cups for a large serving.
- Don't limit yourself to dinner. Rehydrated fruit can be mixed with breadcrumbs for dessert. Quinoa with fruits and cinnamon can be a great breakfast.

How to Rehydrate Dry Food

Dehydrated meals typically require the same amount of water and a 15 to 25 minutes recovery time. If you have a pot protector (insulated pot cover), it will help keep the heat in while the food rehydrates.

Follow these steps to cook your food:

1. Put the food in a pot and put the same amount of water. Soak for 5 minutes.
2. Bring the water to a boil. Reduce heat slightly and simmer for 2 to 10 minutes.
3. Turn off the heat and cover the pot. Let stand for 10 minutes, or until the food is softened and completely rehydrated.
4. Add extras—like cheese—and enjoy.

Pro tip: Keep a small salt and pepper shaker made for traveling with you on hand to adjust seasonings on the go.

Recipe: Dried Spaghetti and Meat Sauce

Ingredients:

Storage bag 1:

- 1 portion of dry pasta
- 1/4 cup dry ground beef (switch with vegetables for a vegetarian option)

Storage bag 2:

- Parmesan cheese on the side
- 1/4 cup packed tomato leather
- 1/4 teaspoon garlic powder

Steps to follow:

1. Place the noodles and meat in the pot and cover them with water. Soak for 5 minutes.
2. Bring the water to a boil and add the tomato peels. Cook over low heat, stirring until the tomato paste is dissolved.
3. Turn off the heat, cover the pot, and let rest for another 5 to 10 minutes, until the meat is tender. Add cheese and garlic to finish.

Dehydrated Shepherd's Pie

Ingredients:

Storage bag 1:

- 1/2 package of mixed sauce
- 1/3 cup dry ground beef
- 1/3 cup dried mixed vegetables (corn, carrots, and peas)

Storage bag 2:

- 2 tbsp milk powder
- Salt and pepper to taste
- Cheddar cheese on the side
- 1/2 cup instant mashed potatoes
- 1/4 tsp garlic powder

Steps to follow:

1. Heat 3/4 cup of water in a pot until it boils. Put in the bag with potatoes and knead the bag and then mix.
2. Place the meat, vegetables, and sauce in the pot and add about 3/4 cup of water. Soak for 5 minutes.
3. Bring the water to a boil and cook for 5 minutes. Turn off the heat, cover, and let rest for another 5 to 10 minutes, until the meat and vegetables look tender.
4. Put the potatoes on top of the meat and vegetables, then top with Cheddar cheese, milk, salt, pepper, and garlic.

These are some ways to make preserves, the plan is to combine several according to your preference and rotate, consume, and have them in a cool space to consume. Consider having them with and without electricity.

You can make many of these foods with your vegetables and fruits, harvested in the garden. In the next chapter, I will explain how to adapt the spaces you have for your crops.

Chapter 6

Garden Projects

Although I will show you different projects in the chapter with some specifications depending on the project, these are the essential tools that you will use in all of them:

- Seeds of different foods
- Containers of various types and sizes
- Large and small shovels according to space
- Gardening gloves
- Watering can

Having a garden at home is an option to gradually improve the quality of the environment. Being responsible for your consumption means owning your food, and in addition to supporting local businesses, you can also help nearby communities.

Unfortunately, many times you don’t act because you think you don’t have adequate space to create a garden, or so it seems. It can even be done inside an apartment. Having a garden at home is easier than you think. Here are some tips to start living greener:

Find the Space

Choose a space near a sunny window to start the garden. If you do not have a very large garden, you can start with a smaller one. Once you’ve chosen a spot, remove any furniture or decorations that block light. The mesh hangs over the windows and the garden is in the open air. If you have a balcony, use it.

Choose the Right Container

There are several types of garden containers: planters, hanging pots, or vertical gardens. The first must be thrown away since a garden is needed for this. Others have different strengths:

Pots

They are the most recommended to start a garden in the apartment, since they are small and take up very little space. Keep in mind that you will have to replace it with a larger one later.

Hanging Pots

For a simple but beautiful garden, hanging pots are ideal. In fact, it is the most environmentally friendly option because you can reuse jars, light bulbs, or vases. However, these imply a revision of the departmental ceiling.

Vertical Gardens

To have a vertical garden, it is important to take into account the weight of the pots, otherwise, choose a resistant mesh. This one goes on the

wall, so the mesh can be used on the balcony, while the wooden furniture (purchased or made by yourself) is used inside.

The Substrate Is Important

Unfortunately, it is not recommended to use only normal soil, but to mix it with a substrate or vitamins so that your garden flourishes and bears fruit in your apartment. The substrates most recommended by experts in plants and orchards, especially coconut fiber or worm humus, are organic and will give character to what you are planting because they are completely natural.

How to Apply It?

Easy. In a container of your choice, add a little (up to half or less) and stir several times. Immediately lightly moisten the soil and dig 2–3 small holes where the seeds will be placed.

The Seeds and Your Future Fruits

While you can choose what to grow at home, some seeds are easier to grow than others, and therefore, more recommended. Start with something small like chili or garlic. Follow with aromatic flowers and spices like chamomile and lavender or mint and parsley. When you have more experience, dare to grow lettuce, spinach, or carrots, it all depends on what you want and the time you dedicate to it. After sowing, cover with soil.

Irrigation Is the Most Important Thing

Each seed requires special watering, however, it is recommended that you water your garden every morning, before the sun shines brightest, at least until they begin to develop buds and small signs of the appearance of what you have sown, that is, before noon. Once they start to develop leaves or flowers, try washing them as well by running water over them.

Also, you can add homemade compost to the soil or make water from banana peels to provide more food and vitamins to the plants you are

growing in your garden. Remember, the more sunlight you give them, the better. If you notice they are growing uncontrollably and do not stand upright or detach, you can place some supports, such as sticks, so that they do not hinder the growth of the plants in your garden.

Build a Vertical Garden

What is a vertical garden? It is a type of vertical cultivation that helps you take advantage of the reduced space at home. They can be located outside or brought inside, they are easy to install, and they are a sustainable base for green food. They add color and renew the air by filtering heat.

This growing method is common in big cities because you can grow many vegetables that grow in partial shade and don't require a lot of space to grow. This is an ideal way to start an urban garden.

Types of Vertical Garden

Difficulty: Easy

The system is simple: A vertical row of containers (which can be built from many types of containers, such as bottles, drums, or bins) with a controlled irrigation system. Hydroponics can also be used to deliver nutrients to the roots without using composted soil.

You can use your imagination to recycle almost anything in your home. These are some of the most used materials for the construction of vertical gardens:

- **Plastic water bottles:** 5-liter or larger water bottles are easy to find and are just the right size for growing plants.
- **Plastic bottles:** For smaller crops, they can be cut and placed from the top.
- **Wooden tray:** Plastic bags or grow cloth can be placed in the interior space of the tray to simulate potted plants.
- **Fabric pots:** In addition to being good for root respiration, they are readily available and inexpensive.

Many leafy plants easily fit into any small space (as long as you can keep it humid), which is why many urban gardeners have started building small vertical gardens out of plastic bottles.

The ideal location for a vertical garden is where the sun shines, even if only for a few hours a day. Good air circulation is also important so that the roots can develop without stagnating.

Weight is important when choosing containers and ropes to do your garden because it determines how long it will be in your place. For example, if you grow heavier vegetables like cucumbers or tomatoes, you need a container that can hold them without the risk of tipping or breaking. Use large containers, but I recommend growing greens and small leafy greens like lettuce, arugula, or spices in your vertical garden so you don't run out of space or have a shortage of nutrients.

The first step is to choose the type of container you want to use. The most popular containers for vertical gardening are recycled plastic containers, but you can also use other recycled materials such as vegetable boxes.

You can modify it to your liking and use what you find. Keep in mind that you will need containers of different sizes depending on the plants you want to grow in your vertical garden.

Materials needed to make your vertical garden with bottles:

- Empty and clean plastic bottles. Where possible, made of very resistant plastic.
- Seeds or seedlings already grown.
- Fertilized land for better growth.
- A cord.
- Some scissors or cutter.

Step-by-Step Construction

1. Cut one side of the bottle into a circle to accommodate the soil and plants. Poke small holes at the bottom so the water can drain.
2. Drill 4 holes in each bottle, two holes one before the other, so that you can pass through the rope you need to hang the garden.

3. Cut the rope in half so they are at the same height.
4. Thread the string through and tie a bottom knot on each side so the bottle is secured.
5. Measure the final distance between each bottle. Leaving at least 20 cm (7.8 in).
6. Put soil and seedlings or seeds, and water well so that the substrate can provide all the nutrients.

Plants That Are Best Suited

Don't know what to grow? Here is a list of the best plants you can have in your vertical garden:

- **Arugula:** It is easy to grow, and a good companion with mint, spinach, and lettuce.
- **Lettuce:** Tolerates some shade, ideal planting sites can be found in the afternoon sun and shade for a few hours.
- **Strawberries:** The best time to plant strawberries is in the spring, so if you're lucky, they can bear fruit in summer. But they can also be planted at any time.
- **Spinach:** Spinach does not need direct sunlight, you can put it in partial shade.
- **Parsley:** Soak for 24 hours before planting. It adapts to any type of terrain, although humus soils are the most suitable.
- **Basil:** Basil is famous for making pesto. It is easy to grow, fast-growing, and requires little maintenance. It is inevitable in my garden!
- **Mint:** Thrives in full sun but tolerates partial shade. Mint is propagated by transplanting shoots or roots, so it's best to keep it in a pot rather than transfer it to the ground.
- **Thyme:** Likes a temperate climate, likes dry, sunny soil, and has strong resistance to frost and drought.
- **Rosemary:** It grows well on dry land. It needs very little watering and does not tolerate waterlogging.
- **Oregano:** Oregano is a very resistant plant, so it should not be difficult for you to take care of it so that it grows strong and healthy.

You no longer have excuses! No matter how small your space is, if you have a balcony or patio, with a few hours of sunlight every day, you can

grow herbs and vegetables at home with a vertical garden.

How to Make Compost at Home?

One of the most frequently asked questions is what type of compost bin is needed for the best experience and process. If you have a large area with enough space, you can make organic compost without any type of container. This method, known as a home compost pile, involves composting organic material and vegetable scraps in a pile. But we only recommend this option because there is a lot of space on the farm and it is always outdoors, in areas without paved ground.

You can choose to do it in a composter, a box, or a specific container for this purpose. If you choose this option, you will need to make a larger or smaller compost bin, depending on the size of your garden. One or two cubic meters is more than enough for a small garden.

You can make wooden boxes and you will reuse a lot of scraps and boxes from your house. Still, others make these compost bins with metal railings and metal mesh around them.

This is the best solution for small gardens, both for order and for aesthetic standards. We have to remember that compost is still a bunch of organic waste.

Steps to Do It

The box must be at least 1 meter (3.28 ft) wide and 1 meter high, the purpose is to increase the temperature inside the compost and allow the organic waste to ferment better. Once you have built your box, follow the steps and recommendations below:

1. You have to create compost in layers, adding about 20 cm (7.8 in) to the level.
2. Water the layers as you build your compost pile.
3. At the bottom, place hard material that touches the ground, like some branches, cones, or bark 30 cm (11.8 in) high. This is done to make the bottom of the pile less prone to rotting, which would damage its structure, and to allow air to enter through the bottom.
4. Immediately afterward you can add dry leaves and harvest remains such as hay. These remains are rich in carbohydrates.
5. The next layer is when we can introduce kitchen remains such as vegetable remains, fruit remains, potato skins, etc. If possible, include materials such as manure from animal farms. This is rich in nitrogen.
6. Add a layer of soil on top, about 5 cm (1.9 in) wide, this will seal the hill we created.
7. Carbonate-rich remains such as eggshells can be added.
8. Add layers to the desired height in the box, covering them with soil when finished. In general, manure and kitchen waste should be alternated with dry waste.
9. It is important to spread the wet and dry litter in alternating layers to prevent the compost from rotting. A little further down you can see different types of waste with examples.
10. Moisten the compost from time to time, as moisture is critical to the fermentation process.
11. Regularly aerate your compost block so it doesn’t end up as a blight and rotten block.

The compost can be ready to use in our garden in about 6 or 8 months, depending on the process, the climate, how well we take care of it, etc. If it smells like fresh soil, then we know that the composting process is going well. We will have the best homemade fertilizer for plants that exist.

Compostable Materials: What Can We Add to Produce Compost?

We mainly can divide the garbage of different garbage layers into wet material and dry material. Composting organic waste is more than throwing organic waste in a bucket like garbage. We have to get out of this thought and understand that it is a simple process but that it requires regular care.

It is important to instill this in the smallest of the house, in addition to the usefulness of this process, and not only teach them to make compost from vegetable waste.

Wet Materials (Nitrogen)

- Organic “trash” in general
- Fresh grass
- Manure
- Flowers and plants
- Coffee grounds
- Fruit remains
- Kitchen vegetables

Dry Materials (Carbon)

- Cardboard or paper scraps
- Dry leaves
- Pineapples
- Tree and bush branches
- Wood sawdust

Now that you know how to make compost, let's look at vegetables you can grow as a beginner.

Vegetables to Start

Radish

They grow fast and just need a good space, a cool and humid place that does not suffocate them.

Black Pepper

It grows best in spring and needs sunlight and 40 to 50 cm (1.3-1.6 in) of space between each seed. You must water frequently.

Cabbage and Spinach

It needs rich, moist soil, and although it will grow in almost any soil, it needs very little sunlight. Note that the seeds should be 30 cm (1 ft) apart.

Onion

They require little watering and you can let them dry out or soften.

Pea

They adapt well to all soils and can improve garden soil for growing other vegetables. They are best planted in the fall and they need cooler climates.

Tomato

It needs a well-lit location with deep root space and light watering a few times a week.

Lettuce

Its seeds can grow almost anywhere, requiring only full sun and constant watering.

Cucumber

It is one of the fastest-growing plants, loves warm weather, and does not require a lot of care.

Carrot

You can grow it at any time of the year, it needs moist soil at the beginning, so you will have to water it often until it starts to grow.

Final Tips for Having a Garden at Home

- Start by choosing the space you want to allocate to the garden: Preferably a sunny place. If you don't have a roof, you can use windows with lots of natural light.
- Make sure there is a water source near the space to avoid spills and mud.
- If you plan to use boxes or pots, try placing a large tray underneath so it can catch the water you use to water the garden.
- I recommend using recycled materials for your garden (pots, boxes, glasses, or cans). Whatever you use, cover them with plastic before putting them in the soil.
- You can use cultivated land and mix it with a vegetable substrate.
- Each plant you will use has its needs. Research which types and how much space they need to grow healthy and strong.
- For best results, add organic fertilizer regularly. You can do it at home, mix it with organic waste or buy sheep manure, which is very cheap and easy to get.
- Homemade organic fertilizers can be obtained from fruit and vegetable skins, egg remains, small remains of other plants, and leftover pulp.

When you have your food at home, grown by you, you enjoy the benefits of gardening, such as taking care of stress, clearing yourself up, and working on mindfulness, but also, you enjoy tasty, healthy, chemical-free foods that are close at hand to strengthen your pantry as we saw in

Chapter 5. Now, in the next chapter, I will talk about hygiene when living off the grid so that without access to everyone's energy, you can have everything clean, which is synonymous with health.

Chapter 7

Hygiene Projects

A person who does not follow hygiene and health habits will not be well-regarded by others. In survival, however, this seems to be a secondary and unimportant issue due to the urgency of staying alive.

The plan is to take care of yourself as the basis of survival: knowledge, skills, and strengths; living in an optimal state of health is a faithful reflection of the strength or will to survive.

Hygiene for Health

Cleaning the Environment and the Shelter

Difficulty: Easy

Tools

- Cleaning stuff
- Brooms
- Rags
- Disinfectants
- Masks
- Protective footwear
- Long socks

Steps to Follow

Survival can occur in all environments—even enclosed or buried in a building—and hygiene must be maintained in all cases.

It is important to avoid areas with animal carcasses and droppings, especially bird droppings. These areas can expose you to diseases such as histoplasmosis… If you are forced to stay there: spray surfaces with water and wear a respirator mask.

If you are in a confined area, please remember: CO is highly toxic. To detect it there must be animals nearby, the smaller the better, such as mice or birds. In case of CO2 symptoms, animals are stunned and immediately withdraw; if the CO2 is less than 21%, the flame will be weakened; when the CO2 concentration increases, the respiratory rate also increases; methane concentration: if we have flames, they will change color; the airflow does not have to be fresh or breathable air; we need to use the air we know for sure for ventilation.

You have to clean the shelter thoroughly, sweep, apply chlorine and disinfectants, and leave each space clean every day to avoid contaminants or bacteria.

Chemical or Biological Contamination

The biological agents that can be used are:

- **Pathogens:** They enter the body through wounds, breathing, food… and toxins that appear immediately after contact, and penetrate the skin, even if there is no wound.
- **Protection against biological agents:** If you do not have them, wear a mask or respirator and cover your face with a damp cloth. Put on your gloves, button up everything, tuck your pants into your socks, and get out as fast as you can. Once out, everything must be thoroughly cleaned with soap and water: clothing, equipment, teeth, hair, and nails…

Radioactive Pollution

When radioactive contamination is suspected, the most appropriate course of action is to stay away from the source of contamination. In case of exposure, it is recommended to destroy the clothes and the elements that are taken. On the other hand, when you are exposed to mild radiation, drinking red wine can help you a bit. This is the method used by sailors on ships carrying radioactive weapons.

Microbiological Risks and Contagious Diseases

You can end up in a survival situation somewhere due to an epidemic, especially in an underdeveloped country, but it can also happen that when collective survival operations are carried out for other reasons, due to less medicine, poor sanitary conditions, etc., there is a health situation, thus, risk of human contact (or contact with animals).

Interventions, regarding the source of infection:

- **Animals:** Diagnosis, treatment, isolation, slaughter (including extermination).
- **Telluric:** Environmental control and disinfection.
- **Human:** Diagnosis, treatment, quarantine/isolation (depending on the duration of the disease, the route of elimination of the microorganism, and the characteristics of the environment).

Measures of the Transmission Mechanism

Direct contact: Health education (use of masks, condoms, hygiene rules…).

Physical contact between people, through droplet transmission (particles >5 μm, airborne for a short time), airborne (particles <5 μm, airborne for long periods). In these cases, we must follow the following recommendations, depending on the form of contagion:

- Cover the mouth and nose with the inside of the joint of the arm and forearm when coughing or sneezing, followed by hand hygiene.
- If you use a tissue, use it and throw it away later.
- Infected people should wear a mask and try to keep a distance of at least 1 meter (3.2 ft) from other people in public areas.
- Wash hands, cutting boards, work surfaces, knives, and other utensils after handling raw foods.
- Vegetables and fruits should be washed before eating.
- Cook the meat well. The juice should be clear and not pink on the inside.
- Do not eat raw or undercooked eggs.
- Avoid raw or unpasteurized milk or other dairy products (cheese).
- Cover the furniture with washable clothing and carefully remove it without shaking it.
- Clean floors and surfaces at least twice a day, paying special attention to the areas with the greatest contact with hands, such as doorknobs, switches, controls, and telephones.
- If you share a bathroom, clean it between each use.
- Pay special attention to personal hygiene.
- Avoid touching others and the objects around you.
- Keep a distance of more than 1 meter (3.2 ft) from people who may be infected.
- Try not to kiss or shake hands.
- Do not touch your eyes, mouth, or nose with your hands (pathogens can live on some surfaces for hours or days).
- No special ventilation or air handling systems are required. Ventilation of closed spaces is recommended.
- People must wear a mask to minimize contagion.
- Indirect contact (intermediate objects, by immersion in contaminated water…): Hand hygiene, correct use of barriers (gloves, masks…), disinfection and/or sterilization of instruments, control of drinking, recreational and residual water.

- Security hygiene measures: Cleaning and disinfection of surfaces and food control.
- Carriers: Pest control, rodent control, waste control.

Personal Hygiene

Difficulty: Easy

Tools

- Soaps
- Toothbrushes
- Clean clothes
- Nail clipper
- Toothpaste or baking soda

Steps to Follow

Prevention: Before Survival

Unfortunately, most of us don’t have regular checkups. Many people think that going to the doctor or dentist is only necessary if something is wrong. Go to the doctor and dentist and prepare the appropriate cleaning and protection materials.

Hygiene During Survival

- **Hair:** No shampoo necessary.
- **Eyes:** Rinse with water twice a day.
- **Teeth and gums:** In survival situations, rub teeth and gums with clean fingers or prepare toothpaste with baking soda or rinse with salt water.
- **Body:** Every day wash your armpits, crotch, hands, and feet with clean water to prevent fungal infections.
- **Nails:** Fingernails and toenails should be kept clean and short.

- **Hands:** Hand hygiene is especially important.

Correct Hand Washing

1. Use lukewarm water.
2. Add soap to palms and rub for 15 seconds, mechanically scrubbing palms, backs, indentations of fingers, and forearms.
3. Put the soap under the faucet.
4. Use disposable tissues if you can.
5. Use alcohol wipes or sanitizing gel when soap and water are not available. If you use a gel, rub your hands together until the gel dries. The gel does not need water to work.

Products That Cannot Be Missing in the Shelter

Essential products: Toilet paper, mouthwash, 96-degree ethyl alcohol, talc, compresses, baking soda, comb, shaving foam, silk or dental floss, tampons, toothbrushes, bar soap, gel and shampoo, razors, bleach,

caustic soda, toothpaste, gloves, powder detergent, normal and manicure scissors, nail clippers, scouring pad, mirror, lip cream, vaseline, anti-lice treatment, wet towels suitable for use in toilets.

Formulas and Creation of Artifacts for Hygiene

Bleach

Tools:

- Something that generates heat for cooking
- Cooking pot
- Filter
- Water and ash in a 1:3 ratio

Steps to follow:

Mix ash and water in a ratio of 1:3. Boil, then let stand for 12 to 24 hours and decant the clear solution from the alkaline water. Finally, filter the bleach to remove the heavier elements. If the water cannot be boiled, although the power of the bleach will be reduced, the solution is to keep the solution with hot water (exposed to the sun), and in one day we will have the bleach.

Mouthwash

Tools:

- Small container to prepare
- Fennel
- Mint
- Sodium bicarbonate
- Seawater

Steps to follow:

You can make mouthwash with fennel and mint to keep your mouth fresh. Baking soda is an option for whitening and cleaning if you have it.

Another option is to use seawater. Due to its high salt content, gargling with seawater is very effective for cleaning.

Soap

Tools:

- A pot that you do not use for cooking
- Space to cook
- Paddles to stir
- Caustic soda and water (proportions 25% parts of water, 65% fat, and 10% soda)
- 1 liter of bleach
- Juice of a lemon
- Soapwort

Steps to follow:

Liquid soap is an antibacterial concentrate that can be used without water.

Soap can be made in different ways:

- **Caustic soda and water.** Proportions: 25% water (preferably distilled), 65% fat, and 10% soda.
- **Lye and grease/oil:** Mix a quart of lye with a pint of oil. Cook over low heat until thick. Add the lemon juice and remove it from heat when it becomes soapy. Put in molds and use them for household cleaning jobs.
- **Soap dish:** Swirl a few soap dish roots in water until foamy.

Toothpaste

Tools:

- Mixing container
- Salt and baking soda in equal parts
- Coconut oil

Steps to follow:

Mix 50% salt and 50% baking soda. If you don’t have salt, the bicarbonate of soda will suffice.

Extra-virgin coconut oil prevents and fights the accumulation of bacteria in the mouth and teeth and reduces inflammation of the gums.

Toilet Paper

Many items have been used since ancient times: lettuce, skins, seashells, rags, seaweed, grass, coconut or corn leaves, and telephone books.

Homemade Laundry Detergent

Tools:

- Boiling water
- Mixing container
- Soap that we made before
- A glass of baking soda
- A pinch of salt
- 1 1/2 liter of boiling water
- Aromatic oil

Steps to follow:

Use a bar of soap (as we already did) and put a cup of baking soda, a pinch of salt, and a liter and a half of boiling water. Stir well and put a little aroma oil in it. Once cold, it can be used in the washing machine.

Toothbrush

A branch of softwood like birch at one end and you remove the lint.

Broom

Tools:

- Rope
- Stick
- Thin branches

- Plastic bottle strips
- Soda bottle mouth

Steps to follow:

We need a long stick to which we will tie thin branches. You can also cut plastic soda bottles into very thin strips to make a broom. The mouth of the bottle is used to crimp the stick.

Gas Mask

Tools:

- Something for the visor
- Rope
- Bottle of soda
- Coal
- Cotton
- Soda-lime

Steps to follow:

It is made by securing the mask and mouth, eye, and nose protection to the head with elastic bands or strings (for example, this body is likely to be part of a 2-liter clear soda bottle). We add filters to this body.

Gas mask filters are the most important, they are made of: cotton, charcoal (to filter many chemicals and toxins from the air), and in many cases, soda lime. It is important to place several layers of material, the first and last being cotton (so that lime and carbon remain in the filter and we do not inhale it). If there is CO in the environment, copper oxide or manganese oxide must be added.

We already know that charcoal can be made by burning wood with very little oxygen, for example by covering the burned wood with the earth. On the other hand, soda lime can be made from quicklime and caustic soda. Add 50% soda ash to the water, mix with lime to make a paste, and heat until solid. Then it just needs to be sprayed.

Quicklime can only be obtained by burning limestone at 900ºCelsius, obviously, we need kilns to reach that temperature. To make caustic

soda, you can take an alternative and make your own lye using ash and water.

To close the creation of this artifact, since copper oxide is mentioned (although its use is quite specific), we can obtain this material by heating copper carbonate until it turns black and letting it settle. Copper carbonate is present in all copper elements and is green in color.

Chapter 8

Animal Breeding Projects

We saw in the previous chapter how you can have good hygiene in your shelter, how to clean yourself, and projects of elements that you must have to take care of yourself; now, since the plan is not only living on preserves and vegetables, I will teach you various steps to breed animals for consumption.

Considerations Before Breeding Animals for Survival

Before you start buying pigs, chickens, and goats, remember that raising these animals is not a Sunday afternoon.

These animals will depend on you for their food, shelter, and other needs; taking care of them requires responsibility, time, effort, and, of course, money. You could face a steep learning curve, especially for those just starting or those who grew up in urban or suburban communities.

Before taking the first step keep in mind:

- **Space:** Do you reside in a city, a suburb, or a large piece of land in the country? The place where you live determines to choose the type of cattle you are going to have. While certain food animals, like pigs, goats, and cows, require spaces to forage, others, like chickens and rabbits, only require a place to live, only require a coop or other small shelter.
- **Food and water sources:** Are you providing enough food and water for your animals? Do you have time to feed them regularly? What kind of food would you give them?
- **Waste disposal (animal manure):** Do you have any way to dispose of your waste? Do you use it as fertilizer?
- **Shelter and protection:** Just like you, animals require shelter and protection from inclement weather and predators.
- **State laws and regulations:** There are suburban communities that prohibit or regulate the keeping of animals of this type in backyards. Keep these rules in mind: breaking the law can result in hefty fines and animals could be at risk of being confiscated.

Now that you have a better idea, let's look at the best types of animals you can have to survive:

Poultry

Chickens and ducks are among the most common when raising animals for the first time. They provide you with meat, and they also lay eggs, which you can use for a variety of purposes. These domestic birds have feathers that can be made into pillows.

The question is, which one do you choose?

Chickens

There are billions of chickens in the world. If others can raise them, so can you. Chickens don't require a lot of space, so they're great for when you don't have a lot of space. They also reproduce quickly and can produce large amounts of meat relative to their food intake. This is without counting the eggs they can give you every 26 hours.

A reasonably healthy hen can lay an average of one egg per day. Eggs are an amazing source of protein and you can do a lot with them. You can turn eggs into omelets, add them to baked goods, boil them, fry them, or scramble them… you know the program. If you have several hens that lay regularly, you can be sure that you will have something to eat for days on end.

Chickens can be low-maintenance when you allow them to forage—they can eat just about anything, including insects and other pests that damage your yard. Chicken manure also contains a high amount of nitrogen, which is great to use as a fertilizer.

Chicks are cheap. You may get them often for just over $1. Considering the benefits, it can be said that keeping chickens is very profitable.

Make a Homemade Chicken Coop

Tools

- Pencil
- Meter
- Saw or handsaw
- Wooden boards
- Driver or hammer drill

Materials

- Round wooden bar
- Hinges
- Calamine
- Bolt
- Nails
- Screws

The Way to Do It

1. The first step is to calculate the surface of the chicken coop we are going to assemble. It is recommended to use 5 hens per square meter as a measure.

2. The next step is to cut the wood according to the dimensions you want the chicken coop to have.
3. Based on the shape of the frame design pattern, assemble the wood with the help of a hammer, an electric drill, screws, and nails.
4. Use a pencil to draw the frame for the chicken coop door and cut it out with a hacksaw. You can also make a window if you want.
5. Inside the chicken coop, you have to place hangers and screw them from the outside of the facade to the inside.
6. It must also have arms with planks and lockers of at least 2 meters (6.5 ft) so that they can be used as nests for chickens. It is recommended to raise them at least 60 cm (1.9 ft) from the ground. Therefore, it is important to have a ramp inside the house.
7. For the doors, you need to fit hinges and latches on the outside to protect the chickens from predators and allow easy access for the chicken keeper.
8. For the roof, you can use sheet metal, which must be well adhered to the structure.
9. For the outside of the chicken coop, so that the birds have room to move, you can close the pen with a net, which must be secured with wooden posts around the entire perimeter.
10. Finally, the straw is placed in the coop along with the drinkers, feeders, nest boxes, and heat lamps.

Ducks

Domestic ducks are deliberately bred to be heavier than wild ducks so that they cannot fly. That means they also offer premium meat.

Just like raising chickens, raising ducks will give you plenty of eggs and is low maintenance.

Unlike chickens, however, ducks are mostly not afraid of the cold. During the colder months, you usually don’t need to take extra steps to keep them warm. They also lay larger eggs than chickens.

But what is the best part of having ducks? They are mostly immune to the diseases and parasites that afflict chickens, so you don’t have to worry about these birds.

Perhaps the biggest change you'll need to make is to your living arrangement: Ducks require a place to bathe and wade since they adore the water. If you do not have much land, you can use an inflatable paddling pool.

Ducks can be fed the same feed as chickens, but you may want to give them some leafy greens in addition to the feed.

Construction of a Duck Pen

Tools

- Squad
- Pencil
- Meter
- Tweezers
- Wood and jigsaw
- Drill

Materials

Duck house fence installation materials can be different, there are wood, aluminum tube, barbed wire, bamboo, and so on. However, the model pen that we will make next uses a wooden base with a perimeter of wire mesh.

As for the tools used in construction, some basic ones are essential, and they are generally used by carpenters, such as:

- Wire mesh for the pen.
- Package of galvanized staples for wood.
- Sheet with the approximate size to cover the entire pen or at least 30% of it.
- Thick plywood boards, served as a floor.
- Nails of different sizes.
- Wooden poles (pieces of wood from 5 to 10 cm —1.9-3.9 in—per side).

Steps to Follow

The first thing is to be able to build a simple, cheap, and very easy-to-make duck coop, although it can be used as a chicken coop, since only some small variants are added, such as plastic containers which are going to be used as a pond.

Here are step-by-step instructions on how to make a duck pen:

Select the Position

This space should be dry, well-ventilated, and drain quickly and smoothly to prevent the pooling of water or excess moisture in the circle. It must also be a quiet area, free from noise from cars and electrical appliances and away from other domestic or wild animals.

It should be noted that the duck facility can be made of any material, but in this case, it will be built on a foundation of wooden posts and fenced with wire mesh. Therefore, it must be possible to excavate and place these columns in this place (if not to place a wooden floor, it is explained later).

Determine the Size

The total area of the pen is very important to maintain the original plan when building the facility. For this, you have to take into account how many ducks you want to have. For these birds, the recommended density is 3 to 4 per square meter.

For example, to raise 10 ducks, about 2.5 to 3 square meters are needed.

Floor

The bottom of the enclosure should be several inches above the ground to keep it dry. Ducks are prone to fungus problems because moisture promotes fungus growth.

First, put 4 wooden blocks on the bottom, which will be used around the entire circumference (the edge of the pen), demarcate the facility, and connect all these blocks so that the circumference of the duck coop is ready. You can use wood glue in the joints and drill or drive nails or screws. This is to keep the lower circumference frame strong and stable.

Once the surrounding blocks that will serve as the rim(s) of the pen are ready, you can begin adding the wooden blocks that will go in the middle of the pen, below the center. Then fix the plywood on top of the joists so the floor is ready.

Place the Pillars

A wooden post will be placed in each corner of the previously constructed floor, the lower end of the wooden post will be attached to the wooden floor, and another wooden beam will be attached to the upper end to make it strong and stable.

Between each corner, 3 more bars will be installed, which are in a horizontal position (lying down), and will connect the vertical bars in the corners. The horizontal wooden beams are one at the bottom, one in the center, and one at the top.

Don’t forget to leave enough space on one side for the door.

Place the Wire Mesh

When the wooden frame of the run or duck coop is ready, all you have to do is install the wire mesh; this step is relatively easy as it just involves wrapping or enclosing the structure with the wire mesh. Start from the end beams where the door will be placed, and fix the net to the wood with the help of galvanized staples.

Be careful not to cover the gap in the door.

Lay the Roof

The roof must be installed carefully and with the help of others. The easiest material to put up is aluminum foil or any other material, but if you don’t have any, you can put down any other material that works. Protect yourself from the sun and avoid cracks that wild animals can use to access the pen.

Install Nest and Drinker

For the nest, you can use containers that have the function of a home nest, for this you can use different containers such as plastic or wooden

bars, boats or barrels, pitchers, and cardboard boxes.

Place the Pond

Unlike chicken coops, ducks need a pool of water. Because they do not have tear glands to moisten their eyes, instead ducks rely on water for this function. That is why it is necessary to have a pond.

However, it is not necessary to dig a hole in the ground and a large mud puddle in the fence to create a pond. All you need is a wide-mouthed container such as a bathtub or a plastic pool, make sure it is not too high and as low as possible.

Rabbits

Rabbits don’t require much to get by. You just need to feed them some green leafy vegetables regularly. Make sure you clean up where they live: rabbits tend to stink when left unattended. Provide suitable bedding and hay.

If done right, you’ll have rabbits without a problem and you will even get kittens. More rabbits mean more meat for you and your family. Raising rabbits is a great way to have meat without consuming a lot of feed or space. In addition to their meat, you can also raise rabbits to use their fur.

Types of Homemade Rabbit Cages

There are many types of rabbit cages available. For example:

- With or without a floor
- With open roof or closed roof
- Pen
- One or more floors
- Outer cage
- Inner cage

Make a Rabbit Cage

Before making a homemade rabbit cage, you should consider the materials to use. To do this, you must consider that the cage has a series of characteristics following the hygiene and living conditions of your rabbit:

- If you will have rabbits outside the house, the cage should be resistant to the elements.
- Easy to clean and resistant to moisture.
- Big enough for the number of rabbits.

That being said, the materials to make cheap rabbit cages are:

- **Wood:** For the structure
- **Aluminum:** For the bars and the base
- **Plastic:** It goes well for the base of the floor or if you will make roofs, such as a tarp

Tools

- Meter
- Wire-cutting pliers
- Saw
- Hammer

Materials

- Stainless steel hinges and lock or padlock
- Plywood panel for the floor
- Wooden boards for the structure and contours
- Metallic cloth or mesh
- Metal staples

Steps to Follow

1. First, take measurements around your house or garden, then draw what you want your rabbit's cage to look like.

2. Choose the material from which the cage will be made. I advise you to use wood, wire mesh, and where possible, a hard plastic or metal plinth for the floor.
3. Cut the material to size. Remember that for a rabbit, the cage must have at least 80 square centimeters (2.62 sq. ft) of space.
4. Assemble your cage and attach the metal mesh to the wood with staples.
5. Finally, check for any sharp areas that could injure your pet.

Also, remember to create a door for your bunny to go in and out of. On the other hand, I recommend that the roof be removable, as this will facilitate the task of cleaning the rabbit's cage.

Goats

In a survival situation, it is good that you have goats. The reason is simple: goats take up less space than cows. They are easier to handle due to the large difference in size and weight.

Goats provide you with products just like cows, such as meat and dairy. Adding that goat's milk is better than cow's milk because it has many proteins, vitamins, and minerals, and it is also low in cholesterol.

Other than that, goats don't demand grass like cows. When things get hard, you can give them weed and the like and they still will be fine. You can also use their manure as fertilizer.

To make the pen, see the step-by-step of the pen for pigs; the same applies to goats.

Pigs

If you're serious about farming and have a handle on poultry and other small animals, it may be time to get pigs.

Pigs are ideal to have in your spaces since they provide a good amount of meat. You can start with two animals. You buy them in the spring and kill them in the fall. If you do well, you can start introducing some

breeding animals for long-term breeding. You can raise them for meat or sell them for their hooves.

Pig farming has its challenges, more so than rabbit or poultry farming.

First, you must have enough space. You need to make a sturdy pen for them to stay in and protect themselves from the elements. The fence should be strong enough to endure their biting and digging: Pigs have been known to hide under fences to get away, so make a sturdy fence. Leave about 4 square meters of space for adult pigs to move around easily.

Pigs cannot sweat, so they require a place, preferably muddy, to roam around and cool off. They also need water and some grass.

The best thing about pigs is that they eat whatever you give them. You can feed them leftovers, or excess produce like bruised fruit or vegetable peels and they will be fine.

However, raising pigs requires two things. Since they spend a lot of time digging, they must be dewormed and vaccinated to safely prevent diseases like foot-and-mouth disease, swine fever, and E. coli diarrhea.

Build a Pen

Tools

- Pallas
- Roof sheets
- Mesh to make walls
- Hammer
- Wire
- Nails
- Metal hacksaw
- Feeders

Materials

For a requirement of 10 animals (including one production female, one male, one replacement female, and pups) and 1 square meter (3.2 sq. ft) per animal, the following recommendations are made:

- **For cold climates:** Adobe or stone walls, 1.30 m high (4.2 ft), with a small covered area of 2.5 x 2 m2 (8.2 x 6.26 sq. ft) and at least an open space of 10 to 12 m2 (32.8-39.3 sq. ft). Parasite infestation can be reduced if additional pens are available for rotation.
- **For temperate climates:** Same size but with mesh walls. The ground level of the covered area should be higher than the uncovered area and have a slight slope to allow for the flow of feces and urine. A floor is recommended.

When feeding females with newborn pups, weaning, or supplementing feeding growing littles, it is recommended to temporarily divide the covered area into small pens with the aid of wooden slats.

The entrance door must be 1.50–1.80 m (4.9-5.9 sq. ft) wide to facilitate cleaning and transfer of piled feces.

The roofs can be made of earth with hollow reeds or corrugated iron.

Pens must have a feeder. Portable wooden feeders are 80 cm (2.6 ft) wide and 2.5 m (8.2 ft) long are suitable. The feeder should be kept 35 cm (1.4 ft) from the ground.

Steps to Follow

1. Where to build the corral. Choose a high, well-drained location. The direction of the pen must be following the direction of the prevailing wind and sun. In cold climates, the highest solar incidence should be sought. In tropical climates, look for cool, airy pens.
2. For humid tropical climates: Make a small enclosure suspended 90 cm (3 ft) from the ground on concrete posts. The platform should be made of wooden beams with spacer slats installed to allow manure to fall out of the house, maintaining the hygiene of the house. Separating pens at least 3 x 2 meters (9.8 x 62 ft) allow efficient management of males, females, and females with young.

3. The roofs can be made of palm or calamine.
4. Wooden feeders can be located inside or outside the house.
5. For less humid tropical climates: Pens similar to those in cooler regions, but with wire mesh walls or wood paneling for better ventilation, are also recommended.
6. The two halves of a metal bucket can make an efficient drinker.
7. Avoid putting up fences near houses or water supplies due to the risk of contamination to homes and children. Children should not be allowed to play inside the enclosure. The feces contain parasites that can be transmitted and can have serious consequences for a child's health.

In conclusion…

Raising animals to survive is not easy.

It's a big step and a lot of effort, but the benefits you get from successful care are worth the effort.

Caring for farm animals takes a lot of getting used to, especially if you're just starting. But with a little practice, research, and determination, it will provide you with a steady supply of food and other products. That way, you avoid worrying about your survival food running out again.

Chapter 9

Doctors and First Aid for Survival

After seeing in the previous chapter everything you must do to get down to business making pens and chicken coops, it is almost inevitable that you will suffer injuries. So, in this final chapter, I will show you how to provide first aiTd in different situations.

First aid can be defined as a series of actions and techniques that allow immediate attention to an injured person in situations where there is no doctor nearby.

These tips should be followed when rendering aid:

- Act quickly but remain calm.
- Avoid crowds.

- Do only what is essential.
- Keep the wounded warm.
- Do not give the injured person anything to drink, eat, or medicate.
- Do not move the injured person unless it is essential.
- Know how to bind up.
- If you don’t know, abstain.
- Calm the injured.
- Perform a proper transfer.

Assess the Person

The plan is that you see the state of the person, how they are, and what they look like to define the severity; for this keep in mind:

- **Primary assessment:** Consciousness should be assessed (check for response) and breathing should be assessed (listen, see, and feel for breath).
- **Secondary assessment:** Includes the complementary examination of the patient to see more injuries: bleeding, burns, wounds, fractures, etc., and the relevant help.

Basic Life Support and CPR

A person can stop breathing for various reasons. If this lasts for a long time, they can have brain death or complete death. It is necessary to render first aid to the patient.

Basic CPR attempts to replace the lack of breathing with artificial ventilation through a technique called “mouth-to-mouth ventilation” and chest compressions with “cardiac massage” to replace the lack of heartbeat.

Basic CPR can be performed by any trained person without special equipment.

RCPB is a set of actions that can be carried out by anyone without special requirements, the objective is: to prevent a situation that could trigger CPR or any other emergency, to understand the emergency

system and how to activate it correctly, and to perform the Cardiopulmonary Resuscitation technique.

The state of consciousness is then assessed.

Kneel at shoulder level and ask what's wrong and shake gently.

If the person is conscious, follow the steps for primary and secondary assessment.

If the person doesn't respond, follow the other steps below.

Open the Airway and Assess Breathing

When dealing with an unconscious person who we suspect may be in cardiac arrest, the ideal is to place them on the floor (a firm, horizontal surface) and lie on their back (supine position) with arms extended along the body. If the victim is pregnant, place an object below (towel, mattress, etc.). The blood returns through veins that reach the heart.

Remove all the clothes that weigh them down and open their chest.

Open the Airways

The path that the air must follow from the outside to the lungs must be clear. When a person loses consciousness, their tongue is likely to "fall out" and block the passage to the lungs.

Therefore, it is necessary to carry out neck extension maneuvers, tilting the patient's head as far back as possible. In this way, the tongue is raised and allows air to flow without obstruction. Known as the forehead-jaw maneuver, the movement is best practiced by placing one hand on the victim's forehead and two fingers of the other hand on the chin, then gently tilting the head back and stretching the neck.

In addition to the tongue, other obstacles can prevent the passage of air. You have to look inside the mouth and remove food debris, dentures, etc. If you can see it, try to extract it with the finger as a "hook." Since a choking-induced cardiopulmonary arrest is rare, it is not necessary to

constantly look at the mouth while performing CPR. After starting ventilation, its invalidation will be checked.

Once the airway is open, we have to check that the patient is breathing. Sometimes the person can manifest (speech or respiratory movements of the patient can be seen). Still, the correct thing to do is to bring your ears and cheeks closer to the injured person's mouth and nose to "feel and hear" their breathing. At the same time, our gaze should be directed to the patient's chest to see if there is respiratory movement. It should not exceed 10 seconds.

If the victim is breathing (sometimes a simple airway-opening maneuver is enough to restore spontaneous breathing. For example, after an apnea), proceed with the primary and secondary assessment, and if the injury cannot be stopped, place the person in the recovery position in lateral decubitus. Call for help until someone arrives, and reassess periodically to check that the victim is still breathing normally.

Start CPR If Not Breathing

As soon as the absence of breathing is detected, resuscitation maneuvers should be started.

The first thing a rescuer should do is give 30 chest compressions through what is called a cardiac massage:

Remember, the victim must be on hard ground.

Kneel next to the victim, at shoulder height.

Place the heel of your hand in the center of their chest (the point where two imaginary lines intersect, one from nipple to nipple and the other from nose to navel) and the heel of your other hand on the first interdigitated fingers. Make sure not to rub against the ribs, and apply pressure to the upper abdomen or the base of the breastbone.

Place vertically on the victim's chest with arms extended, compressing the sternum 4 to 5 cm (1.5-1.9 in). After each compression, the pressure on the chest should be released without letting the hands stop touching it, and compressions should be repeated at the rate of 100 per minute. In

order not to count incorrectly, it is recommended to count out loud from 25 or by pressing 5 times.

After beginning a cardiac massage, the rescuer should combine 30 compressions and 2 rescue breaths.

To do this, the airway must be opened again (front-jaw action) and pinch the nose with the index finger and thumb of the hand placed on the patient's forehead; inhale normally (volume about 500 ml) and blow forcefully into the airway of the victim for 1 second, check if the chest rises and falls. This artificial respiration technique is called mouth-to-mouth ventilation. Remove the victim's mouth to keep the airway open and check that the chest falls as the insufflated air is expelled.

In this case, mouth-to-mouth breathing, or a variation of it (mouth-to-nose if the mouth is injured or has dentures or mouth-to-stoma in laryngectomy), blows air directly onto the person's nose.

Repeat for 2 effective rescue breaths.

Immediately after doing this, you should place your hands in the center of the chest and give 30 chest compressions. You should continue to deliver chest compressions and rescue breaths at a ratio of 30:2 without interruption.

If the first rescue breath fails to raise the chest, the victim's mouth should be inspected and any foreign objects removed before the next attempt.

When the victim is cared for by more than one resuscitator, massage and ventilation should be performed by one and then replaced by the other to avoid fatigue, approximately every 2 minutes. This change must be made without interrupting the operation (1st rescuer performs 2 breath cycles, and 2nd rescuer stands next to the victim, applying pressure immediately after performing the 2nd inflation).

CPR should continue until qualified help arrives and takes over, the victim begins to breathe normally, or the rescuer is exhausted.

Action Against Airway Obstruction

Upper airway obstruction is an emergency that can be critical if the necessary actions are not taken immediately to clear the airway.

The upper airway includes the section from the mouth and nostrils to the pharynx, larynx, and trachea.

The most common causes of airway obstruction fall into two broad categories:

In conscious people:

Food aspiration (choking) due to incoordination between swallowing and breathing at any given time.

Foreign objects or corpses enter the airways from inside the mouth, such as dentures, blood clots, and vomit.

In an unconscious person:

The most common cause of obstruction is tilting the tongue back, blocking the pharynx.

We must verify the difficulty of the injured person in the airway, and once it is determined that there is no respiratory movement or excessive effort, we will proceed to the following actions:

In Conscious People

If the block is not complete, the person will be encouraged to cough vigorously to expel the foreign body.

If the victim can no longer cough, give 5 blows to the back between the shoulder blades in a firm, dry, and continuous manner. The person should stand with the torso slightly forward, support the chest with one hand, and strike between the shoulder blades with the hand's heel 5 times.

If the victim continues to suffocate despite the 5 blows to the back, it is necessary to perform compressions on the abdomen, performing the so-called Heimlich maneuver, that is, standing behind the patient, hugging him/her from back to front, and have the patient lean over slightly by crossing your hands on his/her "stomach." Press hard 5 times, from front

to back, from bottom to top. If the victim is very obese or pregnant, compressions should be done at chest level.

If compressions do not resolve the choking problem, alternate blows to the back and thrusts to the abdomen until the problem is resolved or the victim loses consciousness and shows signs of falling to the ground.

In Unconscious People

If the suffocation is prolonged and causes loss of consciousness, the rescuer must: carefully lower the victim, and if the emergency system has not been activated so far, open the airway (frontal-jaw maneuver) and observe the inside of the mouth in search of objects visible and accessible causing suffocation. If so, do a digital scan, that is, continue to use your fingers to remove the choking object.

Begin CPR, massage, and breaths in a 30:2 ratio, preferably with the head tilted while performing compressions to prevent foreign objects from entering the mouth.

Wounds

If there are wounds, this is the first thing you should do:

1. Wash your hands.
2. Put on some gloves.
3. Clean the wound with soap and water.
4. Dry the wound with gauze from the center to its periphery.
5. Disinfect the wound with an antiseptic.
6. Cover with gauze and tape.
7. Take off your gloves and wash your hands.

Hemorrhages

It can be defined as the leakage of blood from the blood vessels because they were broken.

As with wounds, follow these steps before attending.

To compress the bleeding part:

1. Compress directly in the area with tissues or gauze.
2. Keep for 5 to 10 minutes without removing.
3. If it doesn't stop bleeding, put more gauze.
4. Have the injured member raised.
5. Secure with gauze and bandage.

To compress the artery on the underlying bone:

If it doesn't stop the bleeding, apply direct compression to the artery. If it is in the arms, compress the brachial artery with the fingertips; if it is the leg, hold the femoral artery with the heel of the hand.

Internal Bleeding

Shock symptoms:

- Conscious or not
- Cold extremities
- Bluish lips
- Pallor
- Weak and fast pulse
- Shallow and rapid breathing
- Cold sweating

Amputations

Follow the bleeding protocol. The stump should be compressed as above and then bandaged securely. If this doesn't stop the bleeding, put on a tourniquet (wrap a wide bandage twice, then put a pen, toothpick, etc. over it and secure it with the same bandage), which will stay in place for about 10 minutes. Then remove, and don't apply the tourniquet again if there is no more bleeding. Victims should be taken to a medical center as soon as possible.

Keep the extremities elevated.

Actions on the amputated limb.

Wrap the member with sterile gauze.

Foreign Bodies

In the Eyes

1. Wash your hands.
2. Put on gloves.
3. Locate the foreign body and remove it with the help of sterile gauze or through abundant washings with physiological saline or water.
4. Cover the eye with sterile gauze.

What not to do:

- Rub the eye
- Use sharp objects to remove what is inside

Stings and Bites

Remove the stinger, if any, with the help of a pair of tweezers.

1. Clean the wound with soap and water.
2. Place a gauze pad soaked in cold water or ice.

What not to do:

- Cut
- Suck the poison
- Put mud, saliva, toothpaste, or other home remedies
- Scratch

Burns

What to do:

1. Wash your hands.
2. Put on gloves.
3. Remove watches, bracelets, rings, etc.
4. Put the burned area in cold water for 10 minutes.
5. Cover with sterile gauze, if possible soaked with saline or water.
6. Raise the area.

Sunstroke

What to do:

1. Remove the victim from what generated the heat, and put him in a cool room or place with little light.
2. Store the clothes.
3. Apply cold water compresses.
4. If he/she is conscious, give him/her cool or cold drinks.

Seizures

They usually occur in people with epilepsy. Epilepsy is a neurological disorder caused by brain damage that can lead to severe seizures called “seizures.” It presents with signs and symptoms of falls and unconsciousness, eyes closed or half open, mouth closed, contractions, seizures (repetitive and involuntary movements), and, on occasion, sphincter relaxation.

This is the procedure:

During seizures:

1. Remove nearby objects that may affect the person.
2. Remove tight clothing.
3. Avoid getting hurt by caring for the person without violence. Take care of his/her head.
4. Don’t try to open his/her mouth.
5. Turn the victim to the side if they vomit.

When the crisis stops:

Put the person in a lateral safety position.

Contusion, Sprains, and Dislocations

Contusion

It is the damage of an object that hits the body that does not cause the skin to lose continuity, but damages underneath it and affects other structures. Depending on the intensity of the impact, bruising, edema, and strong soft tissue compression may occur.

What to do:

1. Put local cold without direct contact with the skin (wrapped in a cloth).
2. Raise the affected part of the member if it is a limb.
3. In intense crushing, the affected area must be immobilized, as if it were a bone injury.

Sprain

Separation of the joints that produce distension (or tear) of ligaments. Symptoms: Pain, inflammation, and functional impotence.

What to do:

1. Apply a cold compress to the affected area for the first 36 to 48 hours.
2. Rest of the affected area.
3. Elevate the injured area. Arms should hang in a sling and legs should be leveled.

Dislocation

It is the articular surface that remains separate. It is the result of bending or extending beyond normal limits or a direct blow to a joint. Unlike a

sprain, the joint surfaces are separated and the ligaments are torn. It presents as very severe pain, swelling, loss of strength, and joint deformity.

What to do:

1. Apply cold.
2. Leave the joint as it is, do not try to straighten it.
3. Immobilize.

Fractures

We define a fracture as a loss of skeletal continuity (ranging from a simple crack to a complete break). They can be: closed, where they do not create a break in the skin, or open, where the bone comes out, creating a break in the skin, and therefore, risking infection.

Symptoms: Intense pain, deformity, fuzziness, shortening, inflammation and swelling, apparent functional impotence, and crackling.

What to do:

1. Do not move unless necessary.
2. Do not reduce the fracture, that is, do not introduce bone fragments that protrude from the skin.
3. Remove objects that may be compressing the affected area (rings, bracelets…) due to inflammation.
4. Apply topical cold compresses to closed fractures, protecting the skin (wrap ice in a cloth).
5. If it is necessary to move or transfer the injured person, immobilize the victim without reducing the fractured area, including adjacent joints.
6. Do not make sudden movements.
7. In the case of an open fracture, cover the wound with a sterile or clean dressing before immobilization.

To immobilize a fracture take into account the following:

- Fix with a rigid material (splint) or perform the same function as the rigid material (triangular scarf) once placed.
- Padding of temporary splints (wood, trunks…).
- Immobilize a joint above and below the fracture point:
    - **Forearm:** From the base of the fingers to the armpit; the elbow at 90° and the wrist straight.
    - **Wrist:** Extend the wrist from the base of the fingers to the elbow.
    - **Fingers:** From the tips of the fingers to the wrist, fingers semi-flexed.
    - **Femur and pelvis:** Extends from the base of the fingers to the ribs, hips, and knees; ankle at 90°.
    - **Tibia and fibula:** From the root of the finger to the groin, with the knee straight and the ankle at 90°.
    - **Ankle and foot:** From the base of the fingers to the knee, the ankle forms 90°.
- Fixed in functional position (if possible) and fingers visible.
- Never reduce a fracture (do not put the bone back into place).
- Make sure you move the patient to a hospital.

Major Fractures

Skull Fracture

Look for bleeding from the nose or ears, or leaking clear fluid (cerebrospinal fluid).

Spinal Fracture

It will be suspected if the person cannot move.

Actions in both situations:

- Do not touch the injured person and tell them to stay still. Don’t let him/her bend or twist his/her neck. Never bend over an injured person.

- Notify health services and transfer if necessary. Always move on a hard plane together by more than one person.
- Remain by his/her side, monitoring consciousness, breathing, and pulse.

What to Do in Poisoning

When poisoning is suspected, it is essential to know the causative product. Ask affected people and their colleagues what they ingested:

- What products were processed and how much?
- When was it opened and for how long?
- What PPE and clothing did you have?
- What symptoms were observed?
- Did you drink alcohol or take any medication?

If he/she drank it:

- Search for spoiled products.
- Do not induce vomiting if corrosive substances have been ingested or if the victim is unconscious.
- In exceptional cases, if the patient is conscious: give water with albumin (6 egg whites dissolved in 1 liter of water). Give a scoop, up to 1/2 liter.

For all these cases, unless you have medical training, I recommend that you give first aid and try to find medical help, if not, delve into more medical knowledge with videos and information available so that you can give first aid to the best of your ability given the conditions in which you find yourself.

Conclusion

To finish, I will leave you with some tips to take into account, both in what we have seen and for safety in risky situations where you have to survive a season on your own:

Tips and Common Beginner Mistakes

Many of these are based on the same preparation rules:

- Don’t buy a ready-to-use kit. 98% of what it brings is not worth buying.
- Don’t guess when an emergency will happen, so it’s always good to be prepared.
- Don’t guess what’s going to happen, so be smart and avoid assumptions in your preparation.
- Be realistic and practical. Avoid zombies and *Rambo* fantasies. Focus on the most important things and remember that the simpler the better.
- Don’t let preparation overwhelm or defeat you. The important point is that you enjoy the good life now and don’t get sucked into the dark vortex of depression or spend your life savings on food. You can prepare without rushing, just like buying health insurance doesn’t mean you’ve given up on your health.
- Ignore the noise and extremism that wants to take charge of the preparations. Unfortunately, many sites on the internet are full of spam. They just talk like they are going to save the world.
- Preparing is best when you connect with like-minded people. Seek to connect with others through sites and local groups that know what’s going on.
- Avoid “double dipping” your team. For example, on a camping trip, it can be tempting to take things out of your overnight bag. But then life tends to get in the way and the team remains spread out, creating windows where emergencies you’re not prepared for can occur.

- If you're on a budget, it's better to buy lesser-quality stuff than cheap stuff that won't work when you need it most. It can be set up cheaply, but it's more like DIY and thrift shopping than a dollar store.
- Don't just buy some gear, throw it in the closet, pat yourself on the back, and move on. Unless you practice the supplies and plan, you won't be ready.
- Outgoing packets do not simply depart along a predetermined route to a predetermined location. It should be the first and only bag you should take when you need to leave the house.
- Thinking "I plan to run" or "I plan to stay home" is wrong: emergencies don't care about your plans, and being prepared means being able to do both.

Plan Based on Risks

On social forums, it's common for people to respond to a novice trainer's request for help by asking, "Well, what are you going to do?" Then tailor the program and supplies specifically for that event.

It's not bad and has the advantage of keeping people grounded instead of trapping them in doomsday fantasies.

But in practice, this mental model can lead people to broaden their horizons, reduce the effectiveness or efficiency of their preparations, or give the false impression that there are vast differences in the way they prepare.

The good news is that the basic preparation checklist is the same for 98% of people and scenarios.

Once you get past these points, things start to get personal or complicated, like whether you want to grow an indoor garden in your urban studio, or have unusual medical needs.

- Depending on local risks, some details overlap with essential details. For example, if you're preparing for a hurricane, you'll want to have a storm shutter plan in place as soon as possible. But all the basics, like two-week supplies and a travel bag, are the same.

- Learn about the different types of disasters so you can always be prepared. The mind is a key factor in survival, so being mentally and emotionally prepared will increase your chances of survival.
- Try not to panic. You will be scared during an emergency, but good planning with factual information will help you respond more effectively.
- Know your limits. Knowing your physical limitations, resources, and medical or dietary needs can help develop an individualized survival plan for you and your family.
- Take action: Prepare and rehearse the plan and don't be afraid to modify it to suit your needs.
- Learn to do more with less. If a disaster causes a power or gas outage, you may need to know how to improvise with available resources. Tents are a great example of learning to survive on necessities.
- Keep things simple. Preparedness plans and survival kits should work when applied in reality. The important thing is to test and practice with what you plan to use.
- Be aware of what threatens you, both natural and caused by others. Know routes or safe places to go.
- In case you are forced to leave home, make a mobile emergency kit for you and your family. Keep one in the office, this will come in handy if disaster strikes while you're away.
- Do WISE (Working on Innovative Safety Education). Once your family is ready, share the plans with colleagues and neighbors; it's easier when everyone is on the same page.
- Check your plans. As your home and work situations change, make sure your plan stays in place. Also check your supplies, such as batteries, medicine, or food, to make sure they haven't expired.

As you can see, it is a matter of preparing ahead of time, applying rationality, and thinking, "What would I do if…" Keep in mind to reserve blood pressure, diabetes, or any disease medications that a member of the household may need. At this time it is easy to do in the pharmacy, but if you allow everything to collapse and go out to prepare, I assure you that thousands like you will be in the same situation and you will have little luck. Prepare with time and you and your family will be able to succeed.