



Growing Food Plants in Cambodia



Food Plants International

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Many people are beginning to realise that if we don't look after this planet and start to conserve the amazing range of food plants, then diets and gardening systems will run down and the hunger and malnutrition world wide will only get worse. For a few short years people have been practicing a form of agriculture based on a very narrow range of plant species and varieties and they have then found that they have to use more and more expensive chemicals to keep it all growing.

Most of the large organisations worldwide that are trying to help with hunger and malnutrition (who are commercial businesses out to make money!) are now using a different approach. They use words such as sustainability, agro-ecology, conservation agriculture and biodiversity to indicate the principles of this new approach. They are using a range of plants and varieties from local sources where people can collect their own planting material of seeds. They are growing them in a more natural way with a mixture of plants in a garden and trying to reduce digging the soil and seeking to keep the soil covered and protected with plant mulch.

Many smallholder farmers throughout the world (800 million farmers) have been using these methods and even back 3,000 years ago in the Bible is talks about putting the right plant in the right place and making good use of trees and protecting the soil. There are over 25,000 different food plant species that are being used worldwide. We need to find out what are the most suitable for Cambodia that are also nutritious.

People who are using these methods are finding they can produce lots of tasty and nutritious food for our families, even if they don't have money.

These days, people are calling this approach to agriculture fancy names such as "Agro-ecology" and "Evergreen Agriculture". This simply means growing plants in a natural way that can allow us to keep on growing them without lots of outside or expensive extras.



Growing food in Cambodia

Growing food is one of the most important jobs in Cambodia. It may not be the easiest job and it may not be the most enjoyable, but growing food to feed a family well is without doubt one of the most important jobs anyone can do.



In the world, a child goes blind every minute because they are not eating enough dark green leaves to provide them with Vitamin A. There are thousands of tropical leaves that can be eaten, so the answer is simple.

A country with very special plants

Cambodia has a lot of very good food plants. There are over 720 different food plant species growing in Cambodia. They are God's gifts. Plants often get traded from other countries. The food plants of the country have not been promoted and highlighted in the way they deserve.



Visiting one of the local food markets will quickly show what a rich variety of food plants can be grown in this country. Unfortunately many of these have been brought from Vietnam and not grown locally. But, often, good information about these plants is still in the minds and experience of local farmers, and has not been written about in books. This can make it harder for the next generation of young people to find out about how to grow them. Young people spend more time in school and less time in food gardens.

Naming of plants

Not all food plants in Cambodia have a common English name but most have a Kmer name. The scientists of the world have given every plant a scientific name. This is written in the Latin language, but is often hard to spell and even harder to say. But it is important. This is the link by which people in different countries and with different languages can recognise the same plant.



One common and popular vegetable called “Kangkong” is grown throughout most of the Pacific and most of South East Asia. It is a very important and very nutritious vegetable for the hot humid tropical countries, like Cambodia. Scientists call it *Ipomoea aquatica*. By using this link name we can then find out that many of the food plants grown and enjoyed in Cambodia are also grown in other South East Asian countries. Sometimes people in these other countries have found out things about these plants that would be useful for us to know.



Good quality food

As well, lots of information about these foods cannot simply be collected from village farmers but must be worked out by scientists and people with special equipment. For example, the food composition of these food plants is something that must be worked out by chemists in their laboratories. People in villages may know if a food has energy because when they eat it they can do a good days work. But it is not as easy to know about protein or growth food, and about vitamins and minerals and other foods called health foods. Our bodies need all of these groups to enable us to grow well and stay healthy and have energy to work.

One problem common in Asian countries is diabetes due to people eating too much sugar. There are natural plants that are sweeter than sugar and that do not have this bad effect on our health. A tropical plant called Stevia is one such plant.



A healthy balanced diet

Good nutrition or eating a healthy balanced diet is really very simple. If we eat a wide range of food plants then our bodies will normally get all the different nutrients that they require and will get them in a balanced amount. If some nutrient is lacking in one food plant, then our bodies will find it if we are eating a range of other plants. So everybody should eat a range of different food plants everyday.



The group that is especially important for young people are the dark green tropical leaves as they have many vitamins and minerals, as well as protein. There are at least 380 different edible leaves in Cambodia. If young children fall asleep before the evening meal, it is important to make sure they get some of these leafy vegetables next morning. There are lots of nice spices or flavouring plants that can improve the taste of foods. Everybody should eat a good serving of these dark green leaves everyday.



Local food plants are often very good

Sometimes people start to think that some local food plants are not very special and that any food plant that is new or comes from another country must be a lot better. This is often very untrue. Many of the newer or introduced food plants such as the round or ball-headed cabbage have very little food value at all. Many of the local green leafy vegetables and ferns have 10 or 20 times as much food value as these cabbages.

It is important to find out more information about the food value of different foods if we want to eat well. Citrus fruit, such as lemons and oranges, are often grown for Vitamin C that helps keep us healthy. They do not grow well in the tropics. But the common local guava fruit has 3 times as much Vitamin C and is loved by kids.

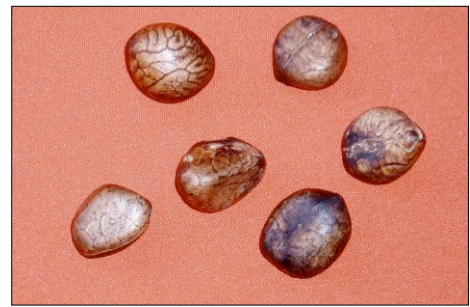


Different kinds of plants for food security

There is another reason for growing a range of food plants in a local garden or around the village. If something goes wrong, like lots of insects damaging plants or some disease occurring in the garden, or the weather changing or a cyclone occurring, some plants will be more damaged than others. If we have a variety of plants, then there will still be some food to eat until the other plants recover and grow again.



There are shrubs that can be planted as edible hedges around houses and fruit and nut trees that need to be planted as a gift for your children, several years before they will be able to enjoy them. Some nuts can be stored and eaten when other foods are not available.



Trees have special advantages as they put down deep roots which not only restores nutrients or plant food back up to the surface of the soil, but they help reduce salty soils and often provide food during drier times of the year. Most yams will store well for a few months. With seed crops that are stored it is important to use airtight containers to stop them getting eaten and spoilt by weevils and other insects.

Learning to grow “wild” food plants

There are still several plants in Cambodia that still simply grow wild in the bush and are not cultivated by people or not grown in many areas. If we look around we can normally find someone who has taken an interest in them and has learned to grow them. This may be people within a different language group than ours, and they have become the experts. It may be, that in their area, they have found sweeter kinds or better kinds than the ones that simply grow wild.

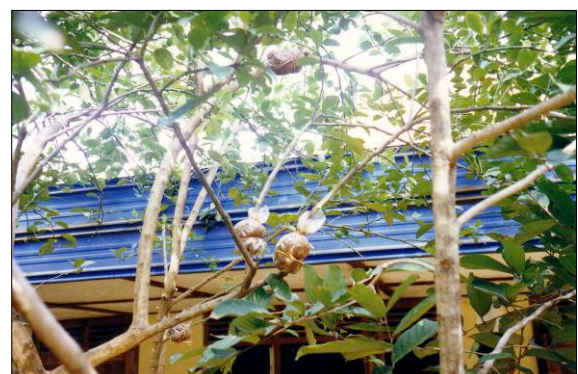
There is still a big need for people to collect these different plants and better kinds and to spread them around amongst other villages.

Saving better kinds

Sometimes if we simply allow plants to grow from seed then the improvements that have been made in finding sweeter or better kinds may get lost. Several local fruit trees are like this and the fruit produced may not be sweet at all.

To stop this happening it is often necessary to take cuttings to be sure the new plant is exactly the same as the old one. If the plants won't easily grow from cuttings simply by sticking a piece of the branch in the ground, then there are some ways of helping these plants to form roots and start to grow.

One good way is to make a small cut in the bark of a young branch then wrap dirt around this cut and cover it with plastic. With plants like guava, new roots will start to grow from this cut and grow into the dirt wrapped around the branch and it can then be cut off and planted. This is called air-layering.



With breadfruit, a similar method is used but with the roots. A shallow root is uncovered and a small cut made and then a new sucker will start to grow. This can be cut off and replanted. There are also methods like rooting hormone and grafting that the agriculture officer may be able to help you with.

Saving seed

Some food plants are grown from seed. Sometimes this is very easy as the seeds are large and store well and grow easily and come up the same as the original plant. With other plants it is less easy.

Many large fleshy seeds such as breadfruit, need to be planted while still fresh as they will not store easily. Other seeds do not “breed true” or do not grow into new plants that are the same as the original plants. So they may not be as large or sweet or the same colour or taste. With many of these plants it may be necessary to find ways of growing them from cuttings or other methods such as grafting, if this is possible. Some plants “inbreed” and get smaller or poorer.



Corn seed grown in small plots normally does this and the plants get smaller and smaller each year. The seed needs to be saved from several different plants and then mixed together before sowing. (All the seed on one cob are related and will inbreed.) Some seeds develop a hard seed coat and need to be scratched or soaked in water or even put into hot water before they will start to grow.



Often saving local seeds is a very good idea. Normally seed saved from pumpkins grown locally will get less pest and disease damage, as they are already adapted to local conditions.

Growing from cuttings and suckers

This is the way many of the food plants of the tropics are grown. It is very important as it allows all the different kinds of yams and taros and bananas and sweet potato and sugarcane to be continually grown and the varieties preserved. Each plant has its own special techniques.

Before simply dismissing the method used by a good and experienced farmer, it is important to think carefully and watch carefully. Often the village person has learned the methods by experience even though the reason for the explanation that they give you may simply sound like myth or “tradition”. It is important to take healthy planting material and several diseases can be spread in the planting material. This can easily happen with taro blight fungus.



By watching several different growers from different places you may be able to improve on the traditional way used in your area. You can of course try out other ways yourself.

Growing a mixed garden of plants

In nature, God never grows only one variety of one plant but always has lots of different plants of different kinds and different sizes all growing together. Anyone who has ever walked into a piece of tropical jungle will know this very well. That is why people all over the world want to save the rainforest because it has so many different kinds of plants all growing together. Growing plants in a food garden in a similar way that they are grown in nature, as a mixed group of plants, is very good agriculture.



In “Western” countries (and also on plantations) where they want to grow a very large area of one plant using very large machines it is not possible to grow plants as a mixture of plants, so they only use one variety of one plant, and put them in rows. But then they have to do lots of special things like spraying pests, diseases and weeds to keep it growing properly. That’s why they need the rows!

Mixing plants in a garden usually gives a lot more stable and reliable food production as the disease from one plant will wash off in the rain onto a different plant where it can’t grow. And small plants will fill up the gaps reducing weeding.

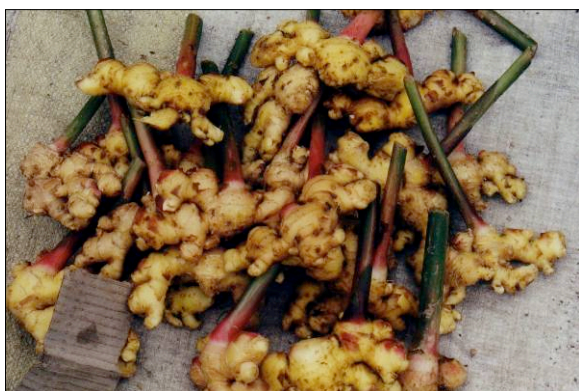


Getting to know plants

People who spend time in gardens and with their food plants often get to know them very well. But different people know different amounts about different plants. It is a good idea to find someone who grows plants very well and to learn from their knowledge of the plants.

Each plant has its own special place where it grows best and there are often special techniques in getting it to grow well. For example, sweet potato won't form tubers if the soil is too wet, but it may still grow lots of green leaves. Taro will grow in light shade, but sweet potato won't. Ginger can grow in fairly heavy shade, including under cacao or coconuts. Pruning off the tips of betel leaf or pepper vines, will cause it to grow more side branches and therefore produce more fruit. Yam tubers in storage need special treatment if you want them to put out shoots early.

There are lots of special things about every plant and a good garden tries to learn these things so they can produce food well.



Food plants with extra uses

Pigeon pea is a small shrub that puts down very deep roots helping it to survive droughts and being a legume or bean family plant it makes nitrogen to improve the soil. The leaves and seeds can be cooked and eaten but it can be cut back and allowed to re-grow and the small branches make good firewood for cooking. Indian spinach (*Basella alba*) is a large vine that can form a lovely shade over a sitting area or back door but also has the benefit of edible leaves that are good for thickening soups. Long beans can be allowed to climb up corn stalks instead of using special stakes.



Several creepers such as smooth luffa and angled luffa can be allowed to climb along fences providing extra privacy. Mature bottle gourds can be used as containers. Pawpaw fruit or leaves can be used to make meat more tender. Mango trees can provide lovely shade. There are many other ways that food plants have extra uses.



Learning to cook well

Even though a few of the nutrients in food can get a little spoilt during cooking, it is normally much safer and better to cook all food plants at least for a short time. There are small bugs called bacteria that can occur in gardens and on food plants and which cause diarrhoea and these get killed during cooking. As well, many plants in the tropics develop a chemical called cyanide that makes them bitter. This happens often with cassava and beans but can be in many other plants. Boiling the food for 2 minutes during cooking normally destroys this poison and makes the food safe to eat.

Some of the food nutrients our bodies need (such as Vitamin A for good eyesight) only become available when food is cooked in oil. Thankfully there are lots of local plants where oil for use in cooking, is easily extracted simply by pressing or squeezing the plant parts.

Looking after the soil

Gardens can develop problems over the years. There are usually 3 reasons for this. In the tropical lowlands, weeds can become a very big problem, especially ones such as nut grass. This is usually a lot less in the first year or two after clearing and burning the land but increases in the following years. As well, some of the plant food or nutrients in the soil get lost and the soil becomes poorer and plants will grow less well. There are ways of reducing this loss of nutrients.

A third reason why soils often won't grow food plants well after a few years is because very small worms called nematodes build up and get into the roots of especially annual vegetable plants and stop their roots working properly. You can often see the roots of plants like tomatoes and beans twisted up as if they have been tied in knots. These worms are called "root knot nematode" for this reason. Flooding as in rice paddies kills these nematodes.

Building up the soil

When a new garden has been cleared it has lots of leaf mulch and other old plant material. This provides plant nutrients for new plants to grow. There is a simple rule for growing plants and improving the soil. "If it has lived once, it can live again." This means that any old plant material can provide nutrients for new plants to grow. But it must be allowed to rot into mulch or compost for this to happen. If this plant material is burnt, some nutrients especially two called Phosphorus and Potassium ("potash"), get left behind in the ashes for new plants to use. But some, such as nitrogen and sulphur get lost in the smoke and disappear from the garden and soil. These last two plant nutrients are especially important for growing green leaves and when they get lost plants can be small or pale green. With nitrogen, the old leaves of the plant go pale and fall off early, and with sulphur the young leaves go pale.

So wherever possibly old plant material should be covered with some soil to allow it to rot down and not simply dry out or get burnt.

Growing food on poor soils where crops won't grow

In several places people recognise soils that are very poor and they avoid them during gardening. Sometimes people allow missions, clinics, churches or schools to use this land as they know nothing will grow properly there. One common reason that these soils won't grow crops is because the soil is very acid or sour.

Many tropical soils are acid or sour. But when they are very acid, plants cannot get their nutrients and things that are not supposed to get into plants become

soluble and get into plants poisoning them and stopping them growing. Adding limestone or crushed coral to these soils can improve them and using compost won't make them less acid or sour but will keep the plant nutrients in the soil in a more readily available form that plants can use. Teachers and Health workers who may wish to set up a demonstration garden on land such as this may need to get special help and advice. It is possibly for an agriculturalist to do a quick test to see if the soil is very acid (or alkaline).

Pests and disease

There are a very large number of insects that enjoy sharing our food with us! We should not try to kill all these insects as they are equally a part of God's creation and have an important role to play in keeping everything in nature in balance. What we need to do is to learn to manage these insects so that we can all get some food to eat!

Some insects get attracted to lights and if the garden is near village lights the damage from some of these insects can get worse. If we plant large areas of one particular crop that the insect likes, then the insect breeds more quickly and the damage gets worse. As an example, insects called armyworms can breed up in large numbers on the shade trees of cacao and then move across "like an army" into gardens. Some insects are large and breed slowly and can be picked off and removed. The large green grubs with pointy tips that hide under taro leaves, are like this and are best simply picked off and removed.

Because insects are in balance, where some damage food while others are good and help control pests, spraying can often make everything worse.! Some insects do not like sunlight. The very small moth than damages banana fruit is like this. Simply pulling off the leafy bracts over the banana fruit reduces the damage as it lets sunlight in and the insect flies away!

The best rule for reducing pest and disease is to grow plants as healthily and well as possible. Healthy plants get less damage.

Diseases

The living organisms that cause disease are much smaller than insects and therefore are less well understood by village people. Sometimes these disease organisms can only be seen with a microscope or even an electron microscope.

There are three main kinds of these disease organisms. They are fungi, bacteria and viruses. Fungi are like the mushrooms we eat but only very much smaller. They usually make distinct and dry spots on leaves and other plant parts. These fungi have spores that can often blow in the wind. Bacteria are often smaller and live in wet damp places. They usually make plants go soft and squashy and they may cause a smell. Bacteria mostly spread with rain and in water.

Viruses are very, very small and usually make irregular stripes and patterns on leaves and other plant parts. These viruses usually spread in planting material or in the mouths of insects, often the small sucking insects that we ignore. It is important to use clean planting material.

One common fungus disease on sweet potato causes the leaves to become wrinkled and twisted. It usually gets worse in old gardens and where soils are running out of nutrients. It doesn't affect all kinds of sweet potato to the same extent. The answer is not to stop the disease, but to improve the soil!

The general rule is that plants that are healthy and growing well will get less damage from disease.

Soil nutrients

Plants need 16 different kinds of plant food or nutrients to grow properly. They need them in different amounts. A plant that has already been growing will already have these nutrients in them and probably even have them in a balanced amount. That is why composting old plant material is so important. But plants usually show some signs or symptoms if one of these nutrients is running out.

One of the commonest and most important nutrients for plant growth is one called nitrogen which actually comes from the air but gets into plants through the soil. When plants, but especially grass family plants like sugarcane, pitpit and corn, are short of nitrogen the oldest (lowest) leaves start to develop a dry or dead V shaped up the centre



of these leaves. The plant can't find enough nitrogen in the soil so is pulling it out of an old leaf to grow a new leaf. The plant doesn't get any bigger as an old leaf dies each time a new leaf is produced! Village farmers often walk through grassland before they clear it for gardens looking to see if the grass leaves are dry and dead, because they know gardens on this soil won't grow well.



To put nitrogen back into the soil it is necessary to use compost or plants from the bean family (legumes and also Casuarinas) as they can do this important job for us. There are tree legumes such as pigeon pea, as well as small garden plants like peanut.



Making compost

Compost is old plant material that has been allowed to rot down into a fine sweet smelling mulch that can be put back on the soil to grow new food plants. The rules for making good compost are very simple. The composting process is carried out by very small bacteria that live in the soil and around decaying plants. They break down plants into compost suitable for plant food. These bacteria are living things, so they need air, water and food!



A simple heap of plant material can be made in the corner of a garden or near a house. It must have air – so don't cover it with plastic or put it in a container (this makes pickles not compost, as different bacteria that don't need air turn it into an acid mixture that preserves it.). It must have moisture, so keep the heap

damp. And the bacteria like a balanced diet, which means you need some green material and some dried material to balance the carbon and nitrogen in the bacteria's diet! If it gets too dry and brown it won't break down and if it gets too green it will go slimy! Using a little bit of compost from an old heap will make sure the right bacteria are there to start the whole process off.

As soon as the plant material is broken down to a fine mulch it can be put onto the garden. It is best if it is dug in but if it is regularly put onto the surface of the garden, bugs and worms in the soil will themselves mix it in. It may take a year or two for these worms to increase in number sufficiently to do this work so keep adding material. Around a house, the soils should always be improving in quality and fertility as the household scraps are added.

The more interest you take in your garden and the more you find out about plants and how to grow them well, the more interesting and fun food gardening

