Inside the House

The Farmers' Handbook

This Volume's Authors : Ms Hom Maya Gurung, Mr Bipin Vaidhya, Mr Laxman Rana, Mr Chris Evans
Translated from Nepali by Chris Evans
Edited, Designed & Produced by: Chris Evans & Jakob Jespersen
Proof reading: thanks to Mike Feingold, Margaret Evans, Ted Albins, Rupert Greville, Jakob Jespersen, Andy Langford, Looby Macnamara
Photos: Jakob Jespersen, Chris Evans
Addional photo credits are given in Volume Five
Cover illustration: Mr Motilal Phauja
Typing: Chris Evans
Computer Coordination: Graphics Edge, Kathmandu
Published by: Chris Evans, Jakob Jespersen.....
Distributors: ..... (see p.8 for address)
Printed by: Format Printing Press, Kathmandu.....
First Edition (Nepali) printed June 2001, 7500 copies
This Edition.....
Farmers' Handbook, ISBN 99933-615-0-X
This Volume One: ISBN 99933-615-1-8

The Farmers' Handbook is about techniques for sustainable farming, and this is the first of 5 volumes. There are 4 techniques presented here. In five volumes there are a total of 44 techniques and approaches.

This Farmers' Handbook is meant for education and awareness raising as well as practical gardening uses. It is permitted to photocopy for such purposes, but please remember that photocopying can cause pollution to the environment, is expensive, and does not give a good quality.

CONTENTS

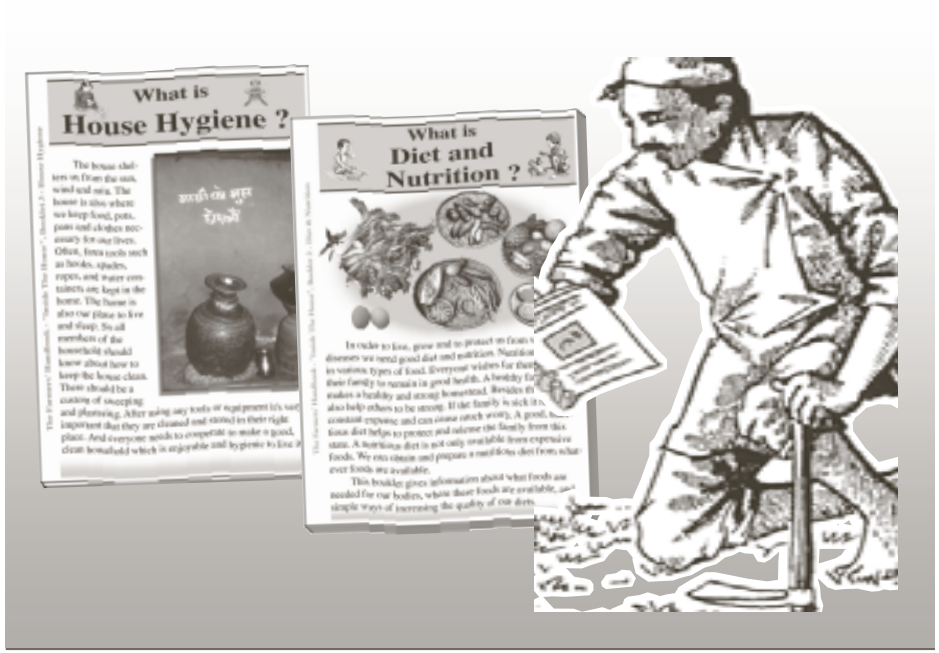
Subject **Chapter No:**

Chapters are separated by a yellow page

The Farmers' Handbook - this Volume's Introduction

This is the first of five volumes in the Farmers' Handbook. In all there are forty techniques and approaches shown, of whch three are in this first volume. Here, we introduce you to some technologies used inside the house. The titles of these are given on the previous contents page.

This Farmers' Handbook provides information about sustainable farming methods, and can also be used as a resource to run literacy programmes. Information about these, and how the Handbook can be used, is provided in volume five. A list of new and/or difficult words and their explanation is also provided in volume five.



Aims

The main aim of this handbook is to help farmers make their own farms more successful. This is done by providing information about using simple methods which strengthen, rather than damage the environment, and help to create sustainable livelihoods for future generations.

Background

The techniques described in the handbook are the results of research made by the farmers of Surkhet and Jajarkot districts of Mid-Western Nepal. We believe these methods will also work well for farmers of other countries. However,around the world there are diverse climates and soils, and so we expect that small changes will need to be made in the techniques according to this diversity. Similarly, it may be necessary to change plant species according to climatic region, but their function will remain the same. For example, the chapter on the **Living Fence** describes the use of thorny plants as a barrier. In the low altitude, hot Tarai of southern Nepal, "Babool" (*Acacia nilotica)* is suitable for this. But this does not grow in the higher elevations. Here, species such as wild pear, wild blackberry and Sea Buckthorn make a good living fence.

Evaluation & Feedback

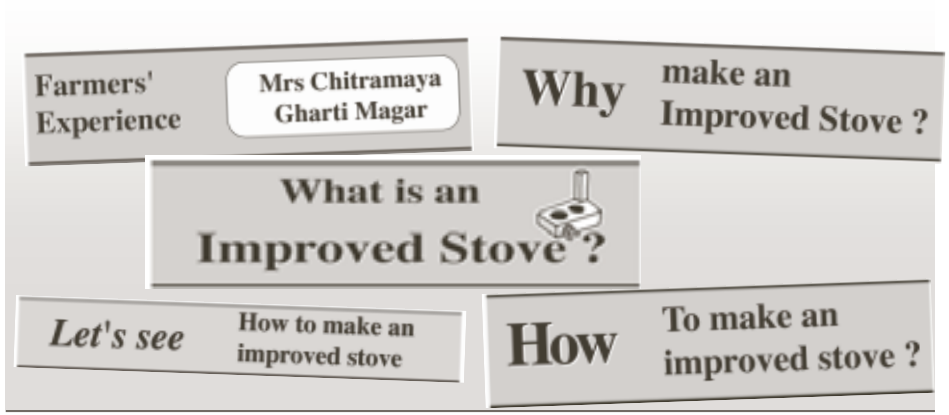
Comments and questions about the techniques and approaches described in this handbook will be most welcome. Suggestions for improvement will be used for future editions of this handbook and other similar publications.

Structure of the Handbook

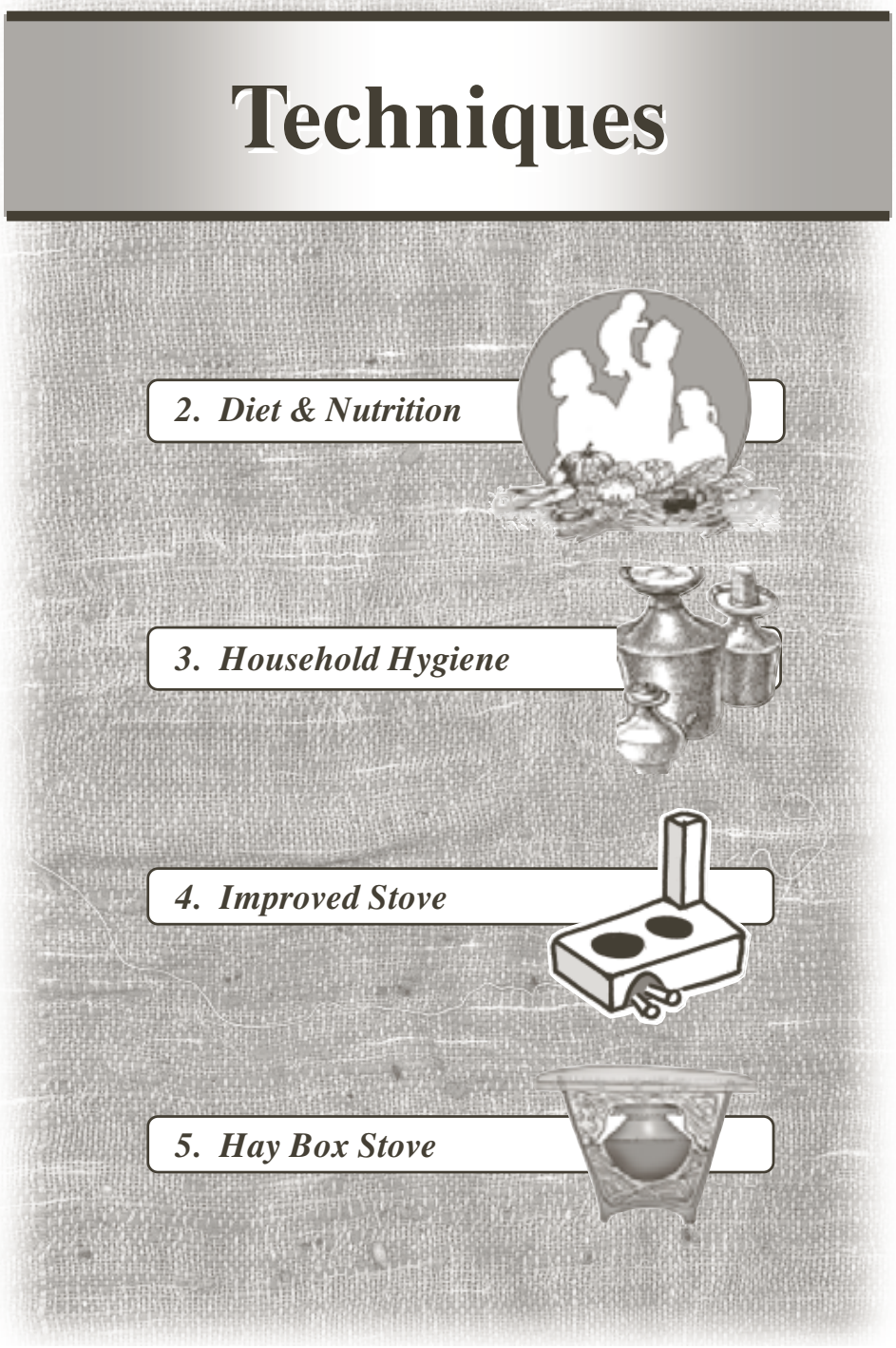
Inside the handbook each method is descibed in a separate chapter, or chapter. All methods are descibed in the same way:-

- "What is?" - the method is defined and described.
- "Why?" - the benefits of using this method are then described.
- The main part is then "How to?" make or do the method;
- In the "How To" section the centre pages show colour pictures about the method.
- After describing how to create the method, how to maintain, care for, manage and/or operate it is described.
- After this, there is an interview with an experienced farmer who has built and used the method.
- Finally, information is given about other chapters in the Handbook which are directly connected to this method.

There are minor changes to this structure as necessary.



Techniques



Appropriate Technology Asia
P.O. Box 8975 EPC 849
Kathmandu
Nepal
tel: +977 1 5549774
nepal@arasia.org.uk
www.atasia.org.uk

Permanent Publications
The Sustainability Centre
East MeonHampshire GU32 1HR
tel: +44 1730 823311
info@permaculture.co.uk
www.permaculture.co.uk

Permaculture Association UK
BCM Permaculture Association
London WC1N 3XX
Tel: +44 845 4581805
office@permacuture.org.uk
www.permaculture.org.uk

Distributor and main contact addresses

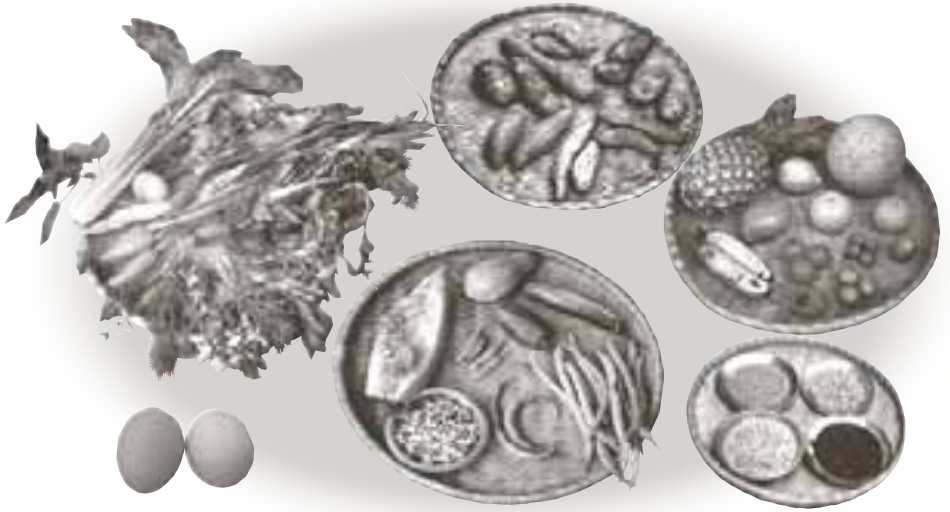
Nepal Permaculture Group
P.O.Box 8132, Kathmandu, Nepal
Tel: +977-1- 252597

email:- npg@earthcare.wlink.com.np

Funding Support

Support for the production and printing of The Farmers' Handbook has come from Methodist Relief & Development Fund (UK), ActionAidNepal, MSNepal, GTZ Food for Work, Helvetas Nepal, Hill Agriculture Research Project (HARP), ICIMOD.

What is Diet and Nutrition ?



In order to live, grow and to protect us from various diseases we need a good, nutritious diet. Nutrition is found in various types of food. Everyone wishes for themselves and their family to remain in good health. A healthy family also makes a healthy and strong homestead. Besides this, you can also help others to be strong. If the family is sick it needs constant expense and can cause much worry. A good, nutritious and balanced diet helps to protect and release the family from sickness. A nutritious diet is not just available from expensive foods. We can also obtain and prepare a nutritious diet from easily available local and even wild foods.

This chapter gives information about what foods are needed for our bodies, where these foods are available, and simple ways of increasing the quality of our diets.

Why Do we need nutrition ?

From the time we are in the mother's womb, for our whole life long, we need a nutritious diet. To give strength, for growing, and to protect or help cure us from illness and disease, there are many types of nutritious elements needed in the body. If any of these elements are deficient in the body, we can become weak and sick. Nutritious foods provide us with energy, help to build and maintain muscle and organs, and help our bodies to produce other important elements which we need to keep us healthy.

Nutritious food, in brief,

- helps us to remain healthy
- helps to protect us from disease
- helps our bodies to grow
- helps us to build a strong household

The Authors of this Chapter

Ms Hom Maya Gurung
Health Technician,
Himalayan Permaculture Group,
Surkhet, Nepal

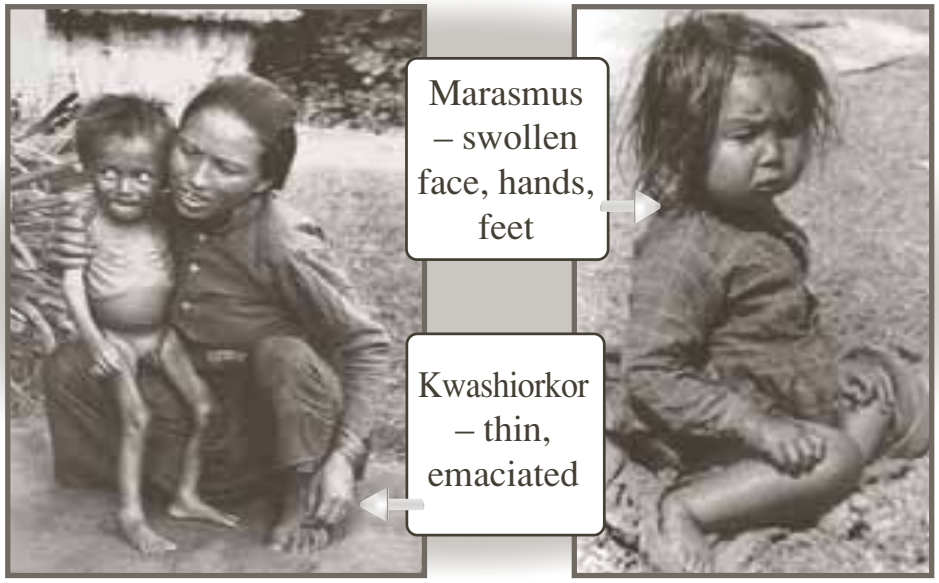
Mr Bipin Vaidya,
Nutrition Programme,
U.M.N.,
Kathamndu,
Nepal

Common problems of poor diet in the home and village

If people do not get the needed amounts of the necessary foods they can suffer from **malnutrition and anaemia**. Babies under five years, children, pregnant women and lactating mothers are especially at risk from poor nutrition.

1. Malnutrition. There are several symptoms of malnutrition, for example:

- **Crying** - continuously crying and lack of appetite
- **Wounds** - cuts, boils, etc. spread on the skin and are difficult to heal.



2. Anaemia - lethargic; poor skin colour; yellowish skin, tongue and nails; poor skin texture

3. Vitamin "A" Deficiency

Vitamin A is essential for eyesight. There are several symptoms of this deficiency:

- Night Blindness - unable to see in half light
- Eyes dry out
- A pale, spongy-like spot in the eye (Whit's spot)
- Blindness

One leaf of *Colocasia* ("Taro") can provide **three children** with their daily needs for vitamin A

4. Iodine Defficiency

Goiter - swelling on the throat
Cretinism - mentally handicapped, poor limb use, etc.

How to get nutrition ?

For Health through nutrition we need to pay attention to three things:

1. We need to have the right foods

Foods are best if crops are grown using **sustainable agriculture** methods. Crops grown without chemicals are more nutritious.

2. We need the knowledge to select the right foods

What to eat and how much to eat ? We need to know how much of what type of food different people need. Who has special needs ? For example, pregnant and lactating mothers, or sick people should have extra of some foods.

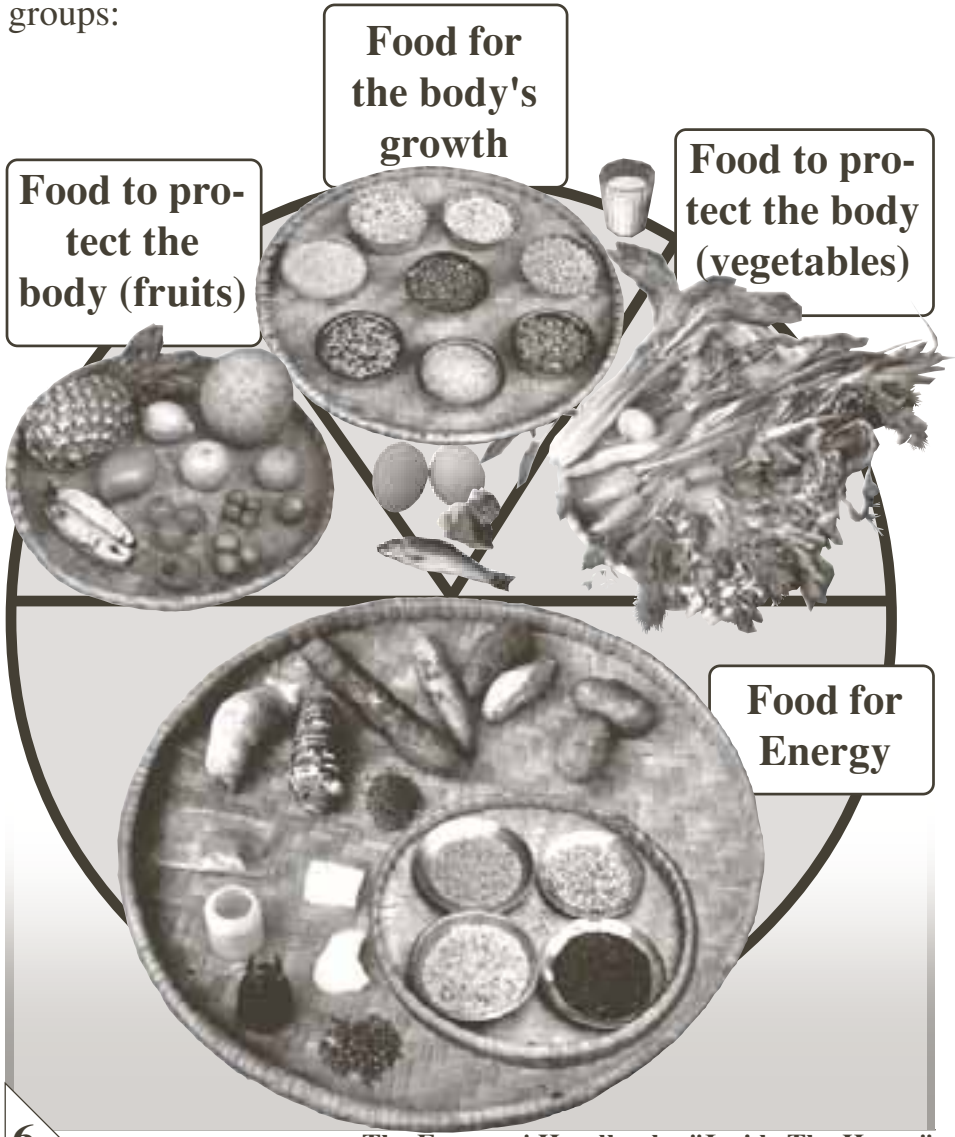
3. We need to know how to prepare and serve the right foods

It's not enough to have the right foods, we need to know how to prepare and cook them. Without this knowledge, we can sometimes loose many nutrients in preparation.

To get health from nutrition we need both knowledge *and* resources.

Types of Food

Just as farming can be divided into various types of crop. such as livestock, grain crops and orchards, so nutrition can be divided into three types of food, according to function. In vegetables and meat there are various nutrients. The most important nutrients of our diet can be divided into these groups:



In this chapter, information is given first about the function of different foods. After that, from page 20 to 22 more detailed information on nutrition is given. The centre colour pages show examples of the different foods in each group.

1. Foods Which give Energy (Carbohydrates)

When there is much physical work, before and after childbirth, and when sick people are recovering, the body needs more energy. At this time, if nutritious food is not available people can become weak and and catch other diseases more easily. Malnourished children also need more energy foods.

2. Foods Which Help the Body to Grow (Proteins)

Healthy babies grow fast But if food for growth is not available, babies become weak, and this can cause them many problems in the future. Growth foods are called Proteins.

3. Foods which Protect the Body(Vitamins & Minerals)

The body always needs protection from damaging things. When recovering after being ill, **energy foods** (carbohydrates) help to get better, while **vitamins** and **minerals** help protect the body from disease. These vitamins and minerals are found in **fruit** and **vegetables**.

A Mixed Diet

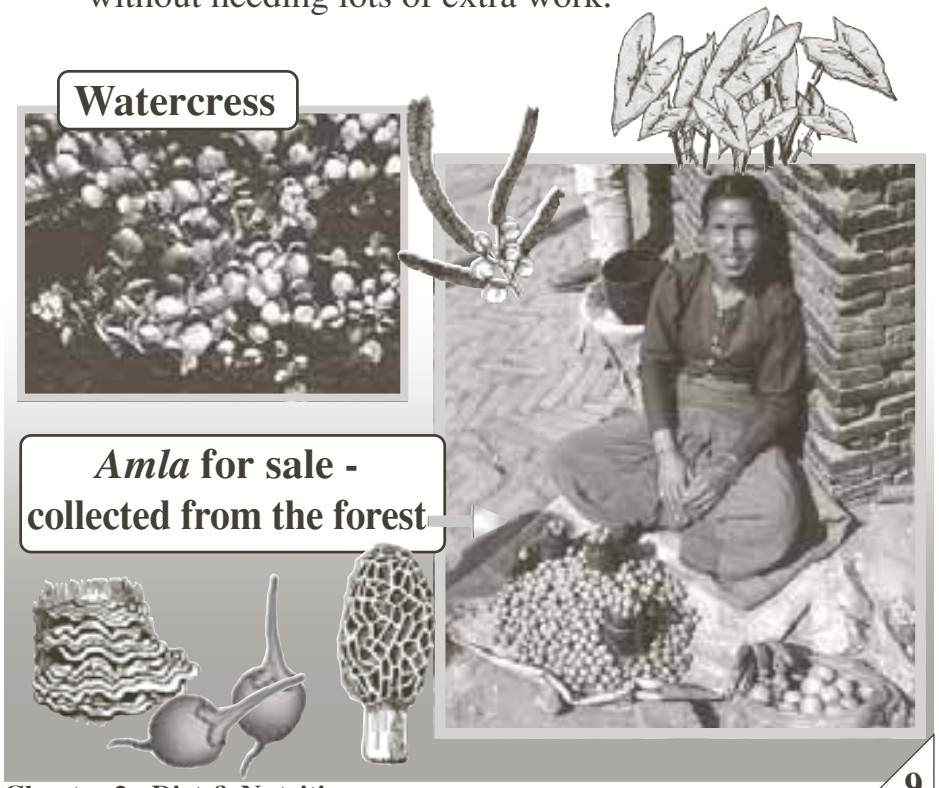
A mixed diet means many different kinds of food are eaten together. Because there are many types of nutritious elements in a mixed diet it is well balanced. It is not enough for the body eating just to stop hunger, or to enjoy the taste. A balanced diet is always needed. Pregnant women, suckling mothers and babies are in special need of a balanced diet. Relatively expensive foods like fish and meat are not essential for a balanced diet. It is also possible to make a balanced diet from foods common in the villages, such as grains, pulses, green vegetables, spices and fruit.

What, is this Poor People's Food ?

There are many nutritious types of food for good health available in the villages. Nettles, buckwheat, millet, watercress, ferns, pumpkin shoots, etc. are all very nutritious. But many cultures regard these as "poor people's food" and so eat them less. If you eat such foods, firstly they are cheap or even free of cost, and also these foods can provide many types of essential nutrients for the body - often more than highly bred "developed" vegetables.

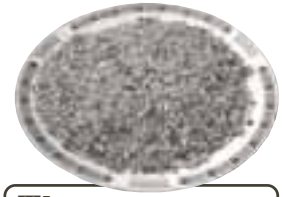
Free Nutrition from the Forest

Community and private forest provides many types of direct and indirect benefits. These include nutritious food available from the wild. Mushrooms, ferns, watercress, bamboo shoots and wild yams are examples of some vegetables that can be found in the forest. Similarly, fruits like berberis, blackberry, amla, chestnut, hazel, walnut, etc. are also available. It is also possible to grow many of these on the edges of farmers' fields to increase the supply, without needing lots of extra work.

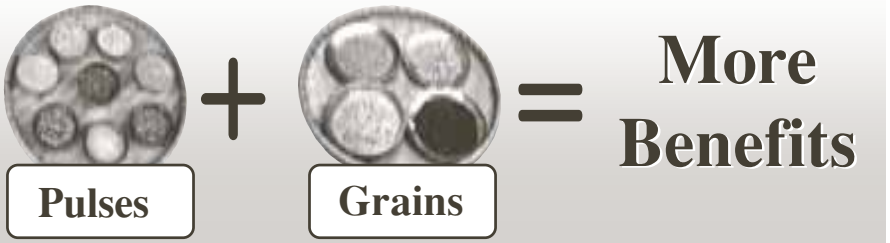


How to Preserve Nutrients in Food During Cooking

- Cooking potatoes with their skins and in peices as large as possible will save vitamin C.
- Don't scrub rice before cooking it as this prevents vitamin B from being washed away
- When cooking rice, don't add too much water which otherwise you'd have to throw it away, along with vitamin B.
- Unprocessed wheat flour has more nutrients than processed white rice flour
- Rice de-husked by hand or pre-boiled contains more vitamin B than rice dehusked in a mill.
- Millet contains more calcium than most other grains.
- When eaten together, grain and pulses provide the same benefits as eating meat



There are more vitamins in rice which has been de-husked less



- Sprouted pulses are very high in nutrients. Pulses can increase their content of vitamins A and C by up to 10 times when sprouted. Vitamin B also increases, and iron and calcium minerals which are in food can be more easily absorbed by the body. For this increase, only a little water and time is needed but the benefits are huge. Why not use easy methods like this?

Soak pulses for a day in water, then wash and drain them every day. After 4-5 days the sprouted pulses are ready to eat.

This is like getting free increase in benefits! There are many types of vitamins which provide more or less nutrients according to the time. In the spring, vegetables or fruit are less available, so at this time vitamin deficiency symptoms are common. But sprouted pulses can be made at any time and so can solve deficiency problems.

- If you wash green leaf vegetables after they have been cut, nutrients can be lost. Always wash **before** cutting.

For a Balanced Diet

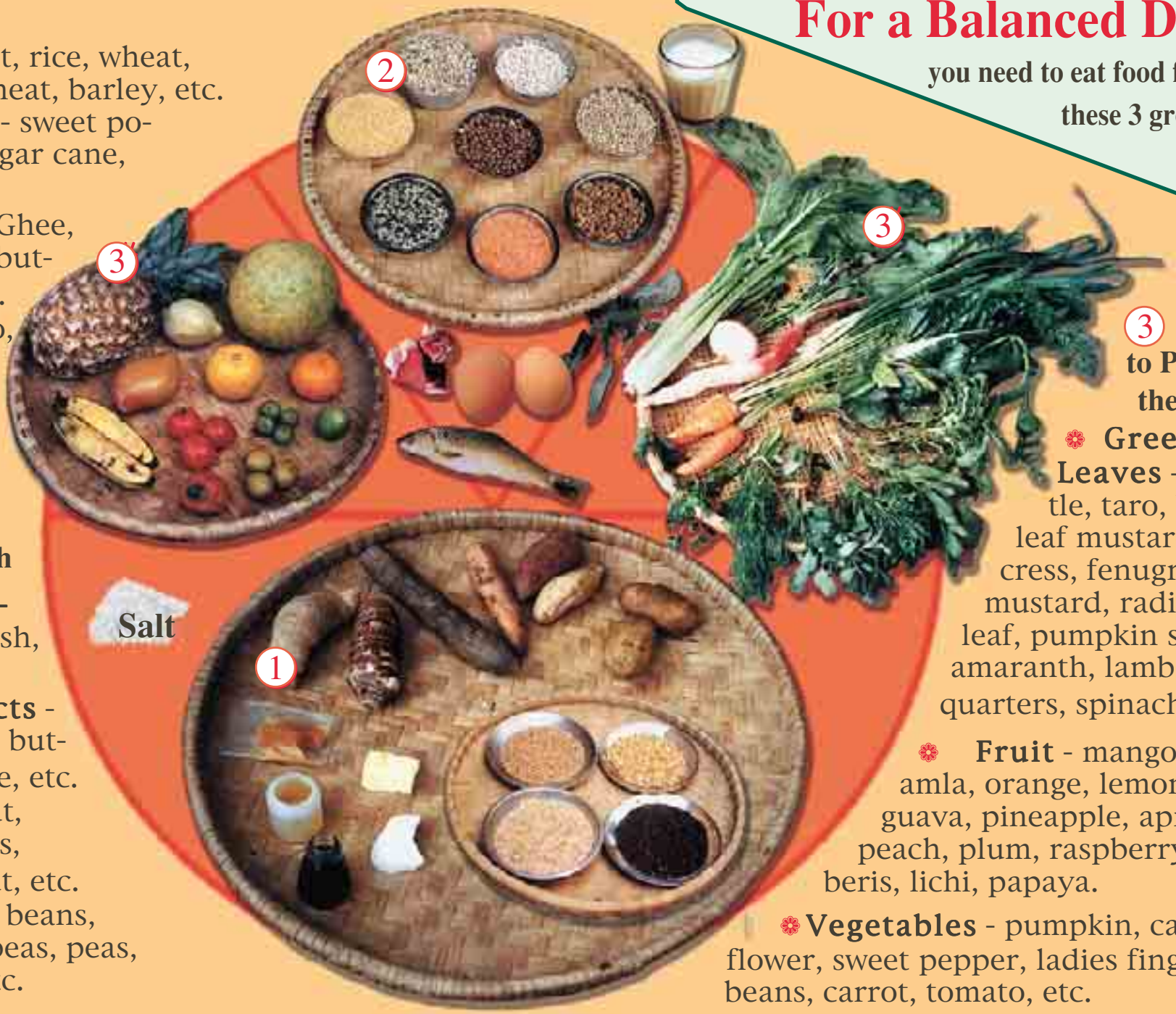
you need to eat food from these 3 groups

1 Energy Foods

- **Grains** - millet, rice, wheat, maize, buckwheat, barley, etc.
- **Sweet Foods** - sweet potato, sugar, sugar cane, honey.
- **Oily Foods** - Ghee, vegetable oil, butter, cream, fat.
- **Roots** - potato, taro, yam, sweet potato, etc.

2 Foods for the Body's Growth

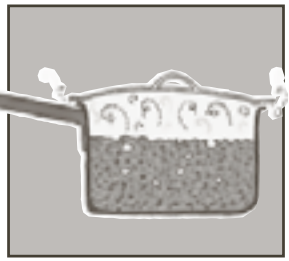
- **Animal Products** - meat, fish, eggs.
- **Dairy Products** - milk, yoghurt, buttermilk, cheese, etc.
- **Seeds** - peanut, pumpkin seeds, sesame, walnut, etc.
- **Pulses** - soya, beans, grams, chick peas, peas, mung bean, etc.



3 Foods to Protect the Body

- **Green Leaves** - nettle, taro, broad leaf mustard, cress, fenugreek, mustard, radish leaf, pumpkin shoot, amaranth, lambs quarters, spinach, etc.
- **Fruit** - mango, amla, orange, lemon, guava, pineapple, apricot, peach, plum, raspberry, berberis, lichi, papaya.
- **Vegetables** - pumpkin, cauliflower, sweet pepper, ladies finger, beans, carrot, tomato, etc.

- Partially fermented vegetables increase the amount of iron and calcium available, which improves digestion of grains.
- Leafy vegetables can be dried in the shade to keep their nutrition and colour.
- Making pickles means vegetables can be kept for a long time and increases their nutrition. In places where there is a long dry season without irrigation, then a monsoon, many vegetables can be grown in only a short time. Making pickles and oils allows these vegetables to be stored and eaten all year round, e.g. cucumber, tomatoes, radish, leaf vegetables, etc.
- when cooking leaf vegetables add a little oil, keep the pan covered and don't over cook. This prevents loss of vitamin A, and absorbtion of oil improves digestability.



Good Food and a Healthy Family

Whose responsibility ?

Additions to the Normal Diet

Sometimes it is necessary to eat more than the recommended daily diet. For example, a normally active pregnant women should eat an **extra handful** of grain, **half a handful** of pulses, a **handful** of green leaf vegetables, and at least **one extra piece** of fruit per day more than her daily diet. A pregnant women who has a heavier workload should eat an extra **one and a half handfuls** of grain, and if she is malnourished she should also eat an extra **one and a half handfuls** of grain.

A woman who has just given birth should eat an **extra handful** of grain, **half a handful** of pulses, a **handful** of green leaf vegetables, and at least **one extra piece** of fruit per day more than her usual diet.

Six months after childbirth the mother should eat an extra **one and a half handfuls** of grains and an **extra one handful** of pulses.

One to two years after childbirth (still suckling) the mother should be eating an extra **one and a half handfuls** of grains and an **extra half handful** of pulses. At this stage she should also be eating **one extra handful** of green leaf vegetables and **one extra piece** of fruit.

• After childbirth a mother should drink 5 teaspoons of "Jwano" (Trachyspernum ammie) each day.

• While a mother is pregnant, and just after childbirth should eat at least 3-4 times a day. For example, 2 full meals and 2 snack meals.

• The best milk for suckling infants is the **mother's own milk**. If this is not given, it can lead to many problems in the future. So it is much better to feed mothers' milk rather than powdered milk.

• Once a baby stops drinking its mother's milk it should be given extra food.

• Always feed a malnourished child extra food.

• A baby with diarroea should be fed more liquids. An oral rehydration mixture of salt, sugar and water should be given. It is even better to give the water skimmed off washed or cooking rice.

• It is better to feed a child little and often. Never stop feeding a sick child. Pursuade it to drink more liquids. A malnourished child should be given a spoonful of honey or sugar a day. This provides more energy. Also, a malnourished child should be fed a banana every day.

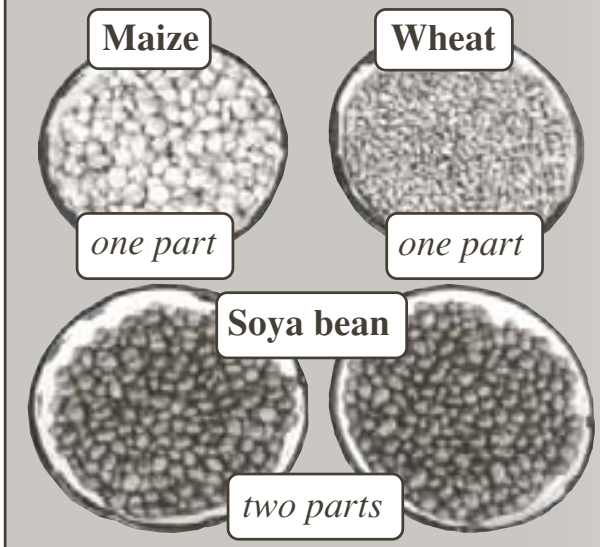
• Similarly, old people cannot digest much food at one time and only eat a little. So they need a mixed meal 3-4 times a day.

Without nutritious food it's not possible to keep healthy

Drumstick Leaves

In sub-tropical areas the Drumstick *(Moringa)* tree is found [this may have other names in your area]. This tree has many benefits. It's leaves are good for livestock fooder and the flowers are good for bees. Its seed helps to purify water. It can be grown easily and quickly from cuttings. Its flowers, pods and newly sprouted, young leaves can all be used as vegetables. The leaves are especially nutritious and can be dried and made into a powder. One teaspoon of this leaf powder provides daily vitamin needs for one person. In cooler, upland areas where drumstick isn't found, you can store and use the powder made in the lowlands.

Super Flour



Maize, wheat and soya bean flour mixed into super flour gives a balanced and nutritious meal. It gives nutrients for energy, growth and protection together

Clean the maize, wheat and soya bean

Bake each of them separately

Then grind the baked grains and pulses separately.

Store the flour in an airtight vessel. Then you can use the processed super flour for several days.

Make the superflour into a porridge and feed to children above the age of 6 months.

Once they're used to it, they'll eat it themselves.

The various types of food and nutrients needed for good health are given below. Information about the function of different elements, effects of deficiency and which foods provide them is also given.

Food type / What does it do?	Deficiency Symptoms	What is it found in ?
Carbohydrate (energy) • gives the body strength & vigour • maintain a balanced body temperature • assists growth & development	• malnourishment (crying, Marasmus, Kwashiorkor	wheat, maize, barley, millet, rice, yam, sugar, cane extract, potatoes (all energy foods exept oils)
Protein (growth) • used for growth & development • growth & maintenance of muscle • making hormones, red blood cells, digestive juices • helps to make up energy needs if lacking in other foods	• malnourishment (crying, Marasmus, Kwashiorkor, etc.) • anaemia, lack of digestive juices	cow pea, fava bean, soya bean, amaranth, peas, fish, meat, eggs, milk, peanuts, pumpkin seeds, walnuts, etc. (all growth foods)
Oil/Fat • gives energy • helps in the body's take up of Vit. A • helps in cell formation	• rough skin	vegetable oils, ghee (purified butter), butter, fatty meat, fish, peanuts, soyabean

Food type / What does it do?	Deficiency Symptoms	What is it found in ?
Vitamin A • keeps eyes healthy • keeps skin soft • helps to prevent disease from spreading	• eye disease (night blindness, dry eyes) • disease spreads between nose, ear & throat • less ability to fight off disease	green leaf vegetable & yellow fruit or vegetables, e.g. ripe papaya, pumpkin, persimmon, carrot, spinach, radish leaf, mustard leaf, coriander leaf, beans, watercress, etc.
Vitamin B group • increases appetite • helps nerve growth & function • helps digestion of carbohydrates	• loss of appetite • tingling feet • burning sensation on soles of feet •sore on tongue • sore in corners of mouth	unhusked grain and its flour, liver, pulses, green leaf vegetables, kidney, fish, meat
Vitamin C • joining muscle fibres • helps wounds heal • helps uptake of iron and calcium	• bleeding gums; infected gums • slow healing of wounds & sores	*amla*, lemons, guava, oranges, raspberries, berberis, fresh green leaf vegetables, potatoes, sprouted grains & pulses

Food type / What does it do?	Defficiency Symptoms	What is it found in ?
Iron (a mineral) • making blood, keeping muscle healthy • protection against disease	• anaemia • dizzyness, weakness, laziness, breathlessness • retarded growth of babies • miscarriage, still birth	green leaf vegetables, pulses, millet, beaten rice, fermented vegetables, liver, meat, eggs, fish, sprouted pulses, food cooked in iron pots
Iodine (a mineral) •helps body's growth • helps brain & nervous system • gives heat from energy use	• goitre • cretinism, spasticism • mental disorders, dull • lack of body's growth • paralysis	seafood, fish, iodized salt
calcium (a mineral) • helps bone, teeth formation & growth • prevents muscle contraction & wasting • helps blood clotting	• poor bone/ teeth formation; crumbling bones	milk & milk products, green leaf vegetables, fermented vegetables, grains, millet, lamb's quarters, pulses, fish

Farmers' Experience

Mrs Thuli Dhimnan

From Nepal, Lalitpur district, Burunchuli VDC, Champi village Mrs Thuli Dhimnan's son Sano Babu was malnourished as a baby. Now let's hear her story.

Mrs Thuli Dhimnan

" At two and a half years of age Sano Babu was nothing but skin and bone. At that time he wouldn't eat and could hardly even walk. It was so hard to feed him at that time. Then I started to feed him superflour porridge with his other food. After only a few days he started to gain weight. After that Sano Babu's two younger brothers were also born but they didn't have the same problems as their older brother. This is how Sano Babu's life improved with a mother's love & care, and good, nutritious food. "

Sano Babu at two and a half year old, malnourished

Sano Babu at twelve years old, with his mother and 2 younger brothers

Read On !

Subjects Related to Nutrition

Good benefits can be had from the information in this book about nutrition. However, this information is also linked to other methods. For extra benefits let's read, learn and practice other related chapters.

Improved Stove Chapter

In Nepal 95% of households use firewood for cooking food. Everyone knows the effects of too much smoke in the kitchen but what to do ? Now let's learn about an easy and successful method.

Hygiene Inside the House Chapter

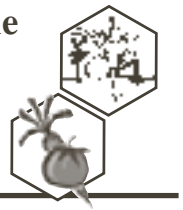
Improved health isn't only about good food. If the kitchen and house is dirty, many diseases can strike. In this chapter information is given about easy methods to keep the house clean.

Fruit Related Chapters

Information on how to produce and grow improved fruit species at home is given in these chapters about the fruit nursery, grafting, budding, top grafting, stone grafting, air layering, fruit seedling planting and integrated fruit orchards.

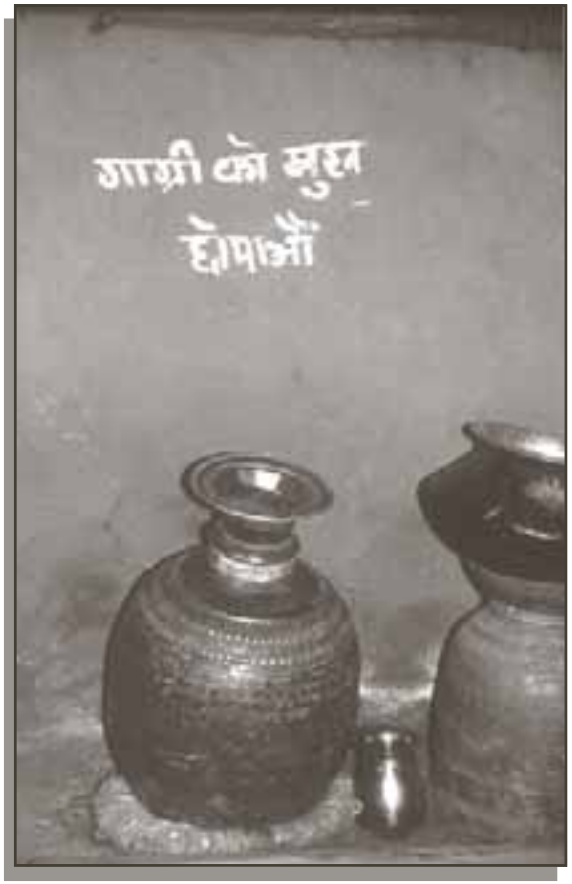
Kitchen Garden and Polyculture Vegetable Growing Chapters

These chapters give information about how to produce good vegetables with less work.



Grihasthi Communications

What is House Hygiene ?



The text on the wall says "Always cover the lid of the water pot".

The house shelters us from the sun, wind and rain. The house is also where we keep food, pots, pans and clothes necessary for our lives. Often, farm tools such as hooks, spades, ropes, and water containers are kept in the home. The home is also our place to live and sleep. So all members of the household should know about how to keep the house clean. There should be a custom of sweeping and plastering. After using any tools or equipment it's very important that they are cleaned and stored in their right place. And everyone needs to cooperate to make a good, clean household which is enjoyable and hygienic to live in.

Why Keep the House Clean ?

Problems leading to not keeping the house clean

• **Dirty Kitchen** :- flies and invisible bacteria like to live in dirty places. So disease can start in the kitchen and on the food there. If there's dirt on the floor it can spread to where the plates, food, water, etc. are.

• **Going to the toilet** :- it's wrong to use just any place as a toilet. Wherever this is done becomes dirty. This attracts flies which carry the dirt to our food.

• **Allowing dogs to eat babies' faeces :**- dogs shouldn't be allowed to eat babies' faeces because it's possible that the dog can then go and lick food plates.

• **Dogs licking plates** :- after eating waste meat, bones or even excrement, dogs can come and lick plates in the house. Many diseases can come from this.

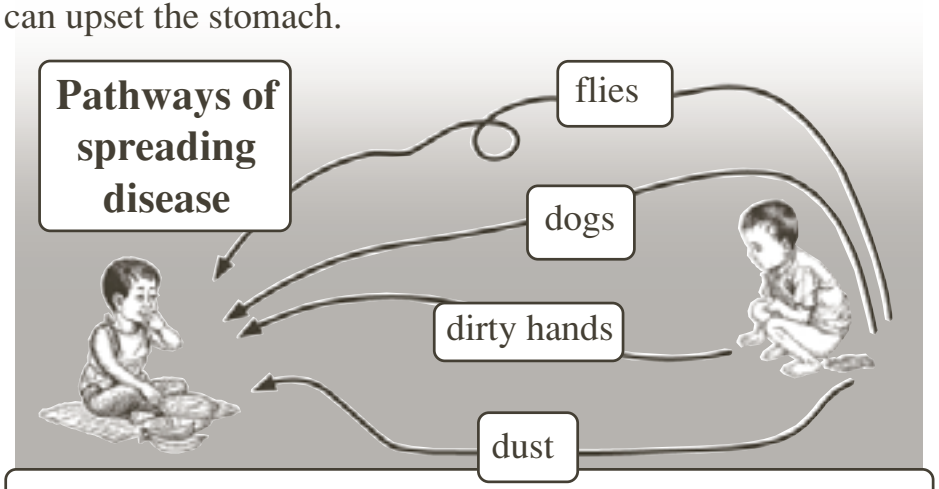
• **Eating food without washing hands** :- we do most work with our hands. Doing this work makes our hands dirty. So before preparing food and eating it we should always wash our hands well with soap, ash or oil seed cake.

The Authors of this Chapter

Ms Hom Maya Gurung
Health Technician, Himalayan Permaculture Group, Surkhet, Nepal

Mr Lal Bahadur Budhathoki
Rural Livestock Health Programme

• **Eating stale (old) food** :- it's important to eat clean and fresh food to stay healthy. So when cooking, cook just the right amount and don't leave food to be eaten later. Old food can upset the stomach.

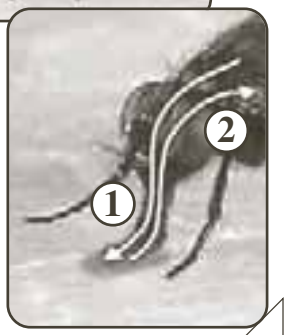


On the right side the child is sick and the bacteria are present in the faeces. On the left side the bacteria get into the other child's plate and food, and the disease is spread. In this way dysentery, gastro-enteritis, worms, typhoid, stomach ache, colds and flu can spread.

How do Flies Eat ?

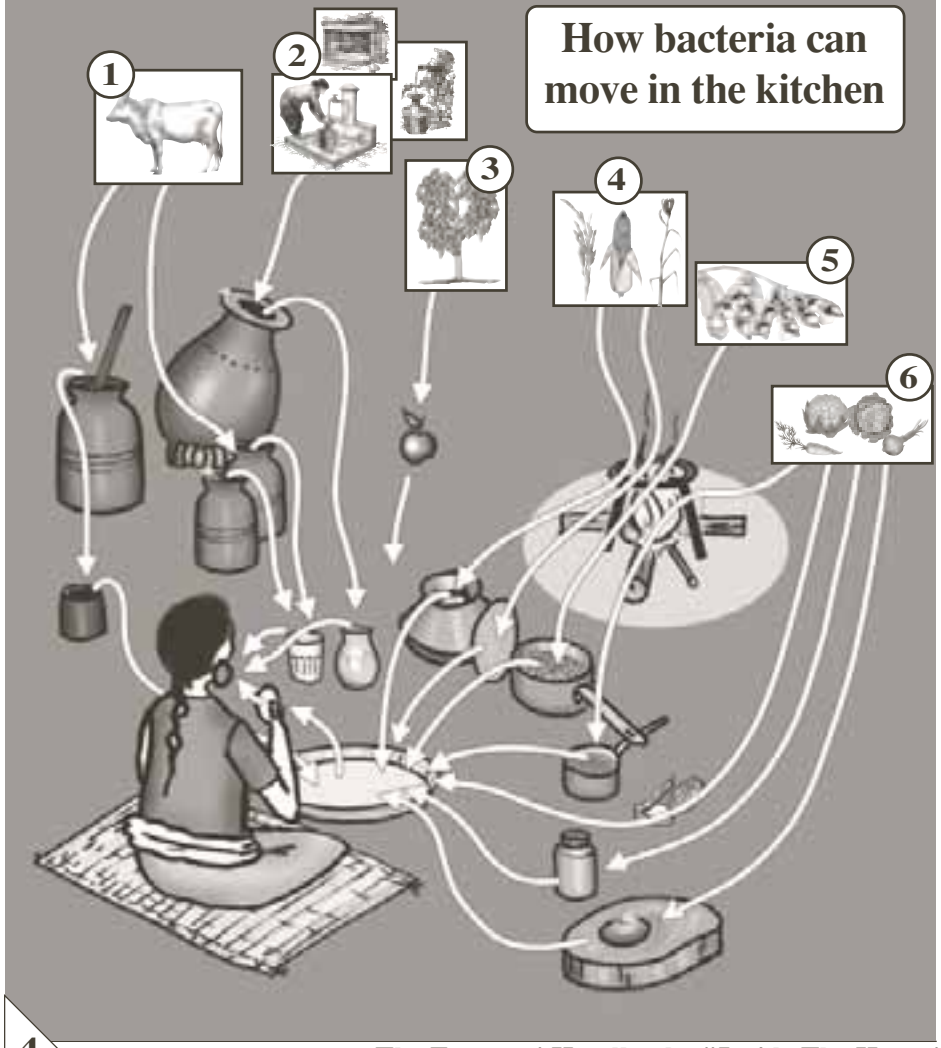
① Flies vomit up the remains of their last meal onto our food. This starts to digest their new meal

② Then the fly eats the old remains and the new food. So, if the previous meal for the fly was faeces, it is mixed with the food on our plate for the fly to eat it. Can we stay healthy by eating that food ?



The picture below shows how bacteria can enter our bodies. In the upper part of the picture are small drawings of where the food comes from. From here arrows point lead to the person's mouth. The numbers given to the pictures below correspond to descriptions on the next page. Read these as you see the pictures.

How bacteria can move in the kitchen



(1) **Milk** :- milk is clean inside the cow's udder but if the person milking has dirty hands this will make the milk dirty. The hands and udder should be washed along with the milk bucket. The milk should be boiled and put in a clean container with a clean lid. Use clean water if making buttermilk or other dairy products, and the container these are put in must also be very clean.

(2) **Water** :- if possible do not use water from streams or rivers. Use water from wells, springs or drinking water taps. It's not enough just to use clean water. The containers it is put in must also be clean and have a good fitting lid. Finally, the cups, glasses, plates, etc. to drink from must also be clean.

(3) **Fruit** :- fruit is clean on the tree but as soon as we pick it, it quickly becomes dirty. Before eating, hands should be clean, and fruit should be washed or peeled .

(4)(5) **Grains and Pulses** :- cooked grains and pulses etc. will become dirty if left uncovered. Dirty utensils used to transfer or serve food will also make the food dirty. Keep utensils off the ground.

(6) **Vegetables** :- just like 4 & 5 above, vegetables can become dirty. If chemicals are used in the garden vegetables should be washed well in water. Vegetables such as radishes, carrot and coriander are often eaten raw, so must be washed in clean water. Plates, bowls etc. used for eating should also be very clean. Grinding stones used for making pickles should be kept clean (see page 13).

Bacteria

Bacteria are tiny organisms that the eye cannot see. These micro-organisms can be beneficial or harmful. In the soil, without micro-organisms there would be no humus made, while in the stomach, if there were no micro-organisms we could not digest our food.

Usually, beneficial bacteria live off dead things, breaking them up and rotting them down, and helping in uptake (digestion) by plants' roots. As for harmful bacteria, they usually live on living tissues, and often damage them. If harmful bacteria get into wounds, or into our stomach, they can make us very sick.

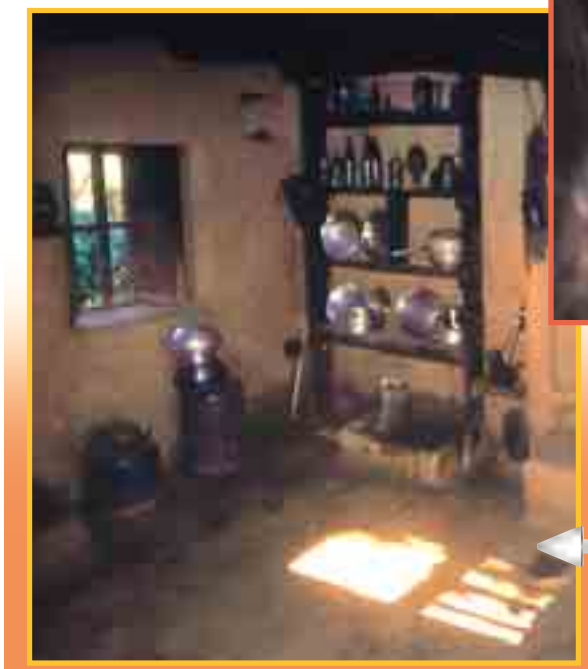
Bacteria seen close up

Bacteria enjoy dirty, dark and moist places so if we want to be protected from possible harm, kitchen pots, pans, clothes, bedding, etc. should be kept clean, dry and as well aired as possible. Before and after any preparation, cooking or eating of food, hands should be clean. Hands should be washed after touching hair, animals (livestock/pets), soil, etc. and before touching food or food containers. Food should remain covered when not in use and old food should not be eaten, except by the chickens! If the hands have a wound then use soap to wash and keep it covered when preparing, cooking or eating food. No spitting in the kitchen, or if possible, anywhere in the house or courtyard. If attention is paid to all these things, then harmful bacteria can't enter and harm our bodies.

Let's see

How to keep the house clean

How many mistakes can you see in this picture?



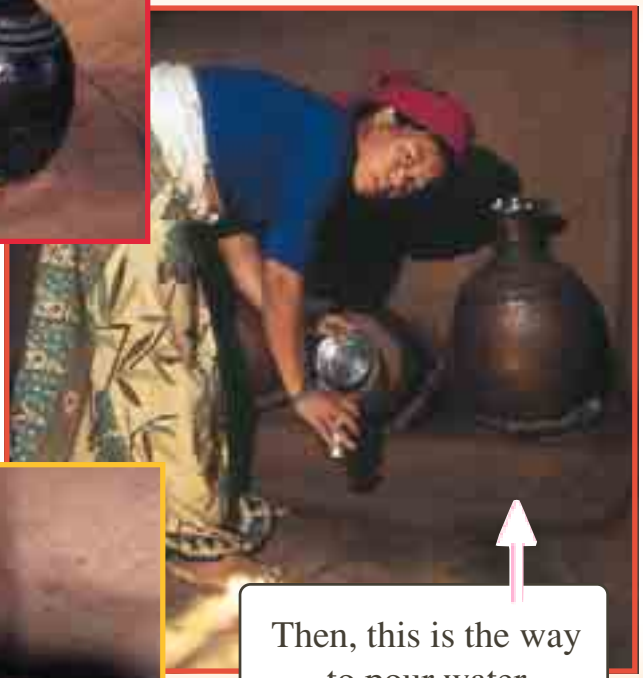
In a well managed house keeping the pots and the kitchen clean is easy

In a clean, dry and light kitchen there is less fear of disease

A basket for keeping pots made from local resources.

The grinding stone should be covered when not in use.

Water containers should always be covered. The text on the wall says "Always cover the lid of the water pot" in Nepali.



Then, this is the way to pour water

Dirt can also get into the milling stone so this should also be covered

How to clean the House ?

Cleaning and managing inside the house isn't difficult. Below are some things to pay attention to for cleaning the house well.

1. Putting away pots, pans, etc. :- pots, pans, plates, etc. should be stored in a cupboard, rack or woven basket in a corner of the kitchen. Water containers should also be kept in a clean and easily usable place in or near the kitchen. The opening of the water container should always be covered with a clean lid. The grinding stone should be cleaned and put away after use.

2. Putting away cutting hooks, digging tools, ropes, etc. :- cutting hooks, digging tools, ropes, etc. should be stored in a place easy to see and access by all the family (except babies).

3. Putting away clothes, etc. :- clothes and bedding should be stored away from the kitchen otherwise dust and smoke can make them dirty. Also, to prevent dust getting from clothes or bedding into the food these should be kept in a separate place, in a rack or cupboard.

Water Containers

Drinking water should always be kept clean. If water is dirty it can cause all sorts of diseases such as diarrhea, stomach aches, colds and flu, worms, etc. Many types of dirt can get into the uncovered drinking water container. While sweeping the house, dust can blow into drinking water containers, and drinking that dirty water can then cause sickness. Being aware of some simple things can help to protect us from these diseases. For example, the water container should always be covered. The water container's lid can be home made. For this, first measure the lid of the water container, and make a lid from wood or thick tree bark to fit the opening. Make a string to tie the lid to the container. Another method is to use a small plate or bowl to cover the lid. The lid of the container should never be put on the floor otherwise it could get covered in dirt, which could then get into the water inside the container.

The Grinding Stone

The grinding stone is a tool used many times a day in the kitchen. After it has been used, it should be washed and stored in a clean place. After the grinding stone has been used, for example to grind spices for pickle, and if it is left uncovered, then while sweeping or doing other work dirt can get onto it. We may bring dirt into the house from outside. This dirt can contain harmful bacteria. If the grinding stone is left out unwashed then these bacteria can then get into the spices etc. we are grinding on the stone. This can then cause illness such as diarrhea, dysentery, worms, and other types of illness. So we should get into the habit of always washing the grinding stone before use. After use, again wash the stone with clean water, dry it and store it covered or upright against the wall of the kitchen. If this is not possible (for example, if it is too big), then the stone should be kept covered by a large lid or bowl, plastic bag, clean cloth or even a plate made of leaves.

If we pay attention to the small ideas given above, we can protect ourselves from big diseases.

Other things to pay attention to

During the monsoon there is much more rain, it gets very muddy everywhere and it's a much busier time for farmers, so everywhere gets much more dirty. So we should pay much more attention to hygiene at this time, compared to other times of the year.

It's easier and cheaper to prevent disease than to cure it. Let's pay attention to this !!

If we don't keep the house clean we can cause many types of health problems. If we can stay healthy all household work is easier. But if we are always sick, how can we run a good household ?

Farmers' Experience

Mrs Atimaya Sunuwar

From Nepal, Surkhet district, Gumi VDC, Ratadada village and a member of "*Hariyali*" women's group, Mrs Atimaya Sunuwar has seen the benefits of good house hygiene. Now let's read about what she says

Mrs Atimaya Sunuwar

"In 1998, I became a member of the local Women's Group and learned a lot, but first I started keeping the house clean. I use a bowl to keep the drinking water container covered, and clean it each day. I keep the pots and pans clean and covered, so they can't get dirty. I always wash the grinding stone. These things are easy, and they only seem difficult if you don't have the habit of doing them. It's the same for cleaning and putting away farming tools such as the cutting hook and digging tools. I put the dust swept out of the house into a sweepings pit. Apart from keeping the house clean, this makes good compost too. There's lots of benefits when we keep the house clean. If we can't keep ourselves clean, then what other work will we be able to do ?"

Read On !

Subjects Related to House Hygiene

Improved Stove Chapter

In Nepal 95% of households use firewood for cooking food. Everyone knows the effects of too much smoke in the kitchen but what to do ? Now let's learn about an easy and successful method.

Diet and Nutrition Chapter

Many diseases can be prevented by a healthy diet, In this chapter, information is given about the benefits provided by different types of food.

Waste Water Chapter

This chapter gives information on how to get irrigation for the garden from domestic waste water.

Sweepings Chapter

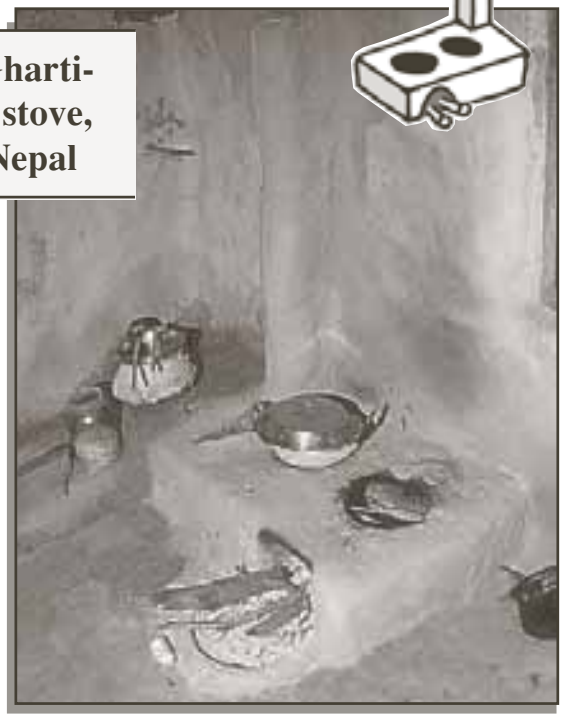
Information about making good compost from sweeping the house and yard is given in this chapter.

Pit Latrine Chapter

Everyone has a responsibility to use a proper toilet. Information about building and correct use of the pit latrine is given in this chapter.

© Grihasthi Communications

What is an Improved Stove ?



Mrs Chitramaya Gharti-Magar's improved stove, Surkhet district, Nepal

The stove is the heart of the household. The stove turns our hard-earned farming produce into tasty and wholesome food. A well managed stove helps in other work also. If the stove isn't good, smoke in the kitchen will cause health problems and a lot of firewood will be used. In this chapter, a useful method is given to help solve these problems, which can bring big improvements in the kitchen, and from there to the household.

This method is called the **improved stove**. The improved stove can be cheaply made from local resources, and helps to remove smoke from the kitchen, while using less firewood.

Why make an Improved Stove ?

Differences between traditional and improved stoves

Traditional Stove or Tripod	Improved Stove
1. Uses a lot of firewood	1. Uses less firewood
2. Food cooks slowly	2. Food cooks quickly
3. Can only cook one item at a time	3. Can cook 2 items at a time
4. Cost of tripod	4. Don't need tripod
5. Smoke stays in kitchen	5. Smoke goes outside
6. Smoke damages health	6. No harm to health
7. Makes kitchen utensils dirty with soot	7. Doesn't make kitchen dirty
8. Small children can fall in the fire	8. No fear of small children falling in fire
9. Cooking makes the pots black with soot	9. Pots kept cleaner during cooking
10. Wind can make the fire jump	10. Stove not affected by wind
11. Can't make tripod from local resources	11. Stove made from local resources
12. Food cools quickly	12. Food stays hot longer

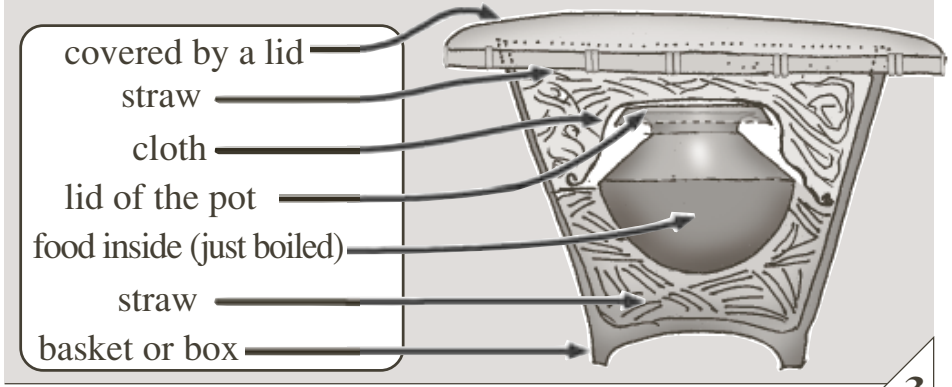
There are some disadvantages of the improved stove. These are :-

1. Large pieces of firewood can't be used;
2. The stove gives less light and direct heat in the kitchen;
3. The stove needs good maintenance, and from time to time you need to let the smoke into the kitchen (see page 22 for more information).

Other methods to reduce firewood use

While cooking, keeping the lid on pots helps to reduce firewood use. This also helps to conserve nutrients in the food.

Another method of conserving fuelwood is called the **"Haybox"**. This can be made in a basket or box filled with tightly packed straw, as in the picture below, As soon as food (rice, pulses, vegetables, etc.) is brought to the boil on a normal stove, the pan is removed and placed in the hay box, and covered well. Here, there is no fire, but the food slowly keeps cooking, due to the conserved heat in the box. This takes 20-30 minutes longer than on a stove. After a while, take out the pan and the food is ready to eat.

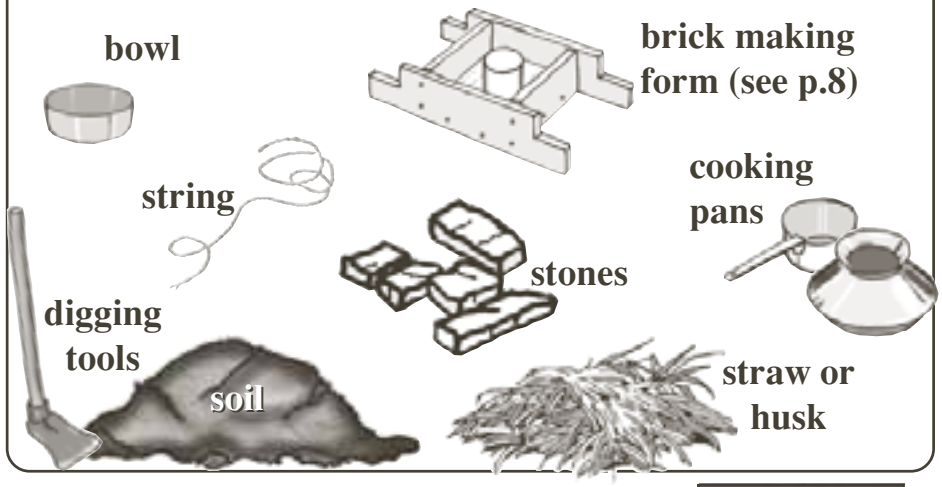


How To make an improved stove ?

Things to consider when making an improved stove

- get all the materials and tools ready first;
- map out the height of the kitchen's wall;
- map out the stove according to the needs of the family;
- allow for a place to clean the stove;
- the hole to allow smoke out should be out of the wind.

Materials needed to make an improved stove

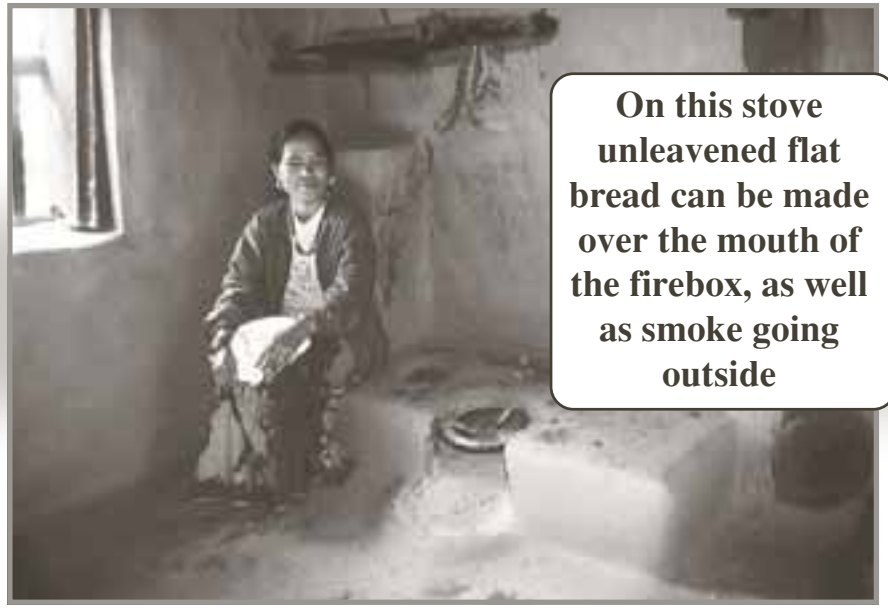


This Chapter's Author:
Mr Laxman Rana
Community Service Group,
Dahachaur 4, Surkhet, Nepal

Making the Improved Stove

An improved stove uses a chimney to pass the smoke out of the kitchen. There are 2 ways of making a chimney to do this :-

1. **Making bricks using mud "pancakes"**
2. **Making bricks using a wooden form or mould**



On this stove unleavened flat bread can be made over the mouth of the firebox, as well as smoke going outside

1. Making bricks using mud "pancakes"

In this method only clay, straw or rice husk, water and a small bowl are needed.

First mix the clay and the husk, or straw cut into 2 inch lengths, with water to make a stiff texture, like dough.

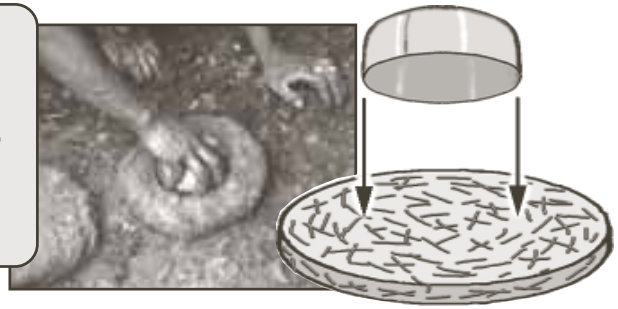
see the pictures on the next page

Making bricks from clay "pancakes"

1. The pancakes should be 8 inches in diameter

2. The bowl should be 4 inches in diameter

3. Place the bowl upside down on the pan-cake and press down, like this



4. The up-turned bowl will cut the clay

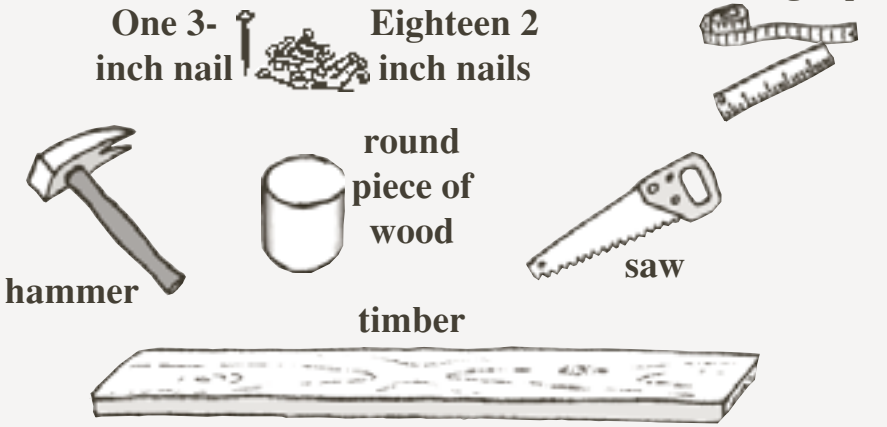
make 30-35 pan-cakes like this

5. This will make a hole the same shape and size as the bowl

2. Making a chimney using a wooden form or mould

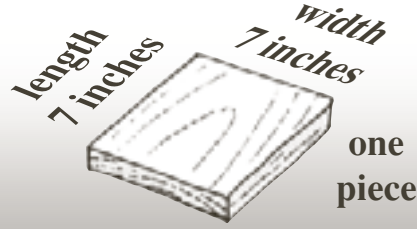
One village will need only one of these forms

Materials needed to make the form

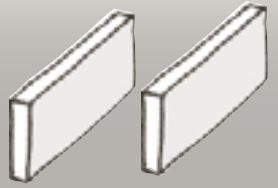


length 4-5 feet, width 7 inches, thickness half to one inch

Cut the timber into pieces as shown here

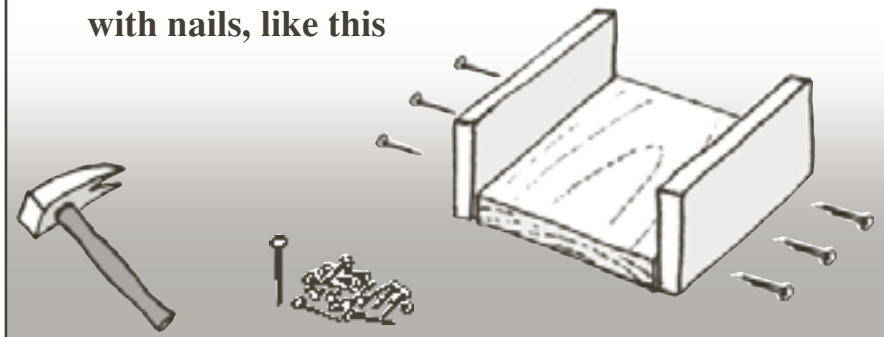


one piece



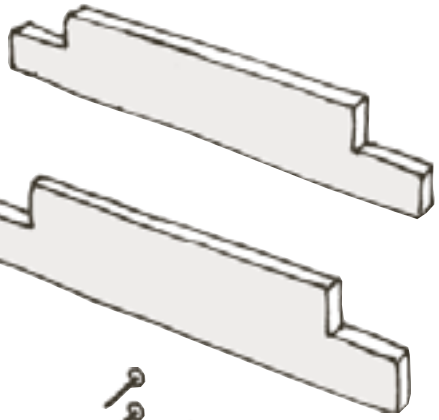
2 pieces of length 7 inches and width 4 inches

Join the 3 pieces of wood with nails, like this

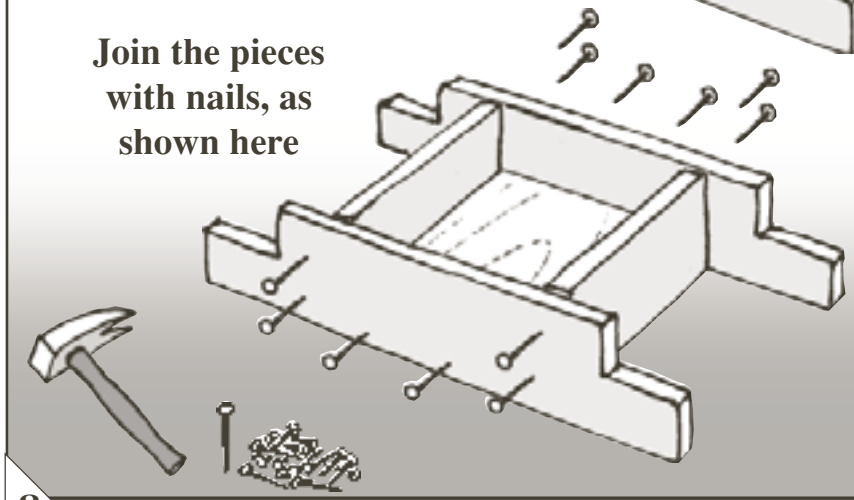


Saw 2 pieces of wood as shown below

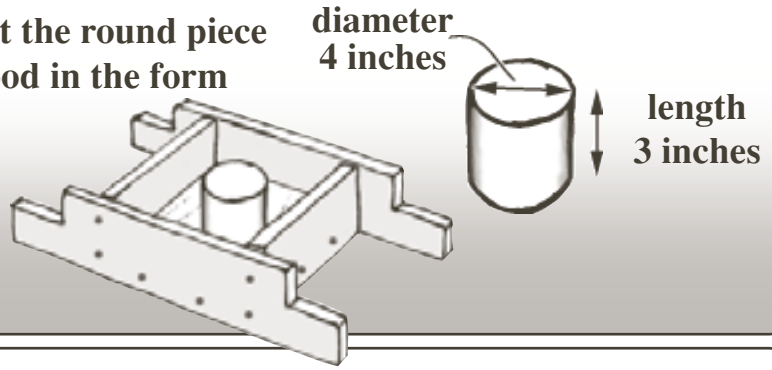
length 15 inches, width 4 inches



Join the pieces with nails, as shown here

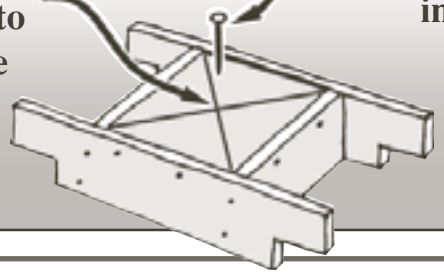


Now put the round piece of wood in the form



On the underside of the form make an 'X' between the 4 corners to find the centre

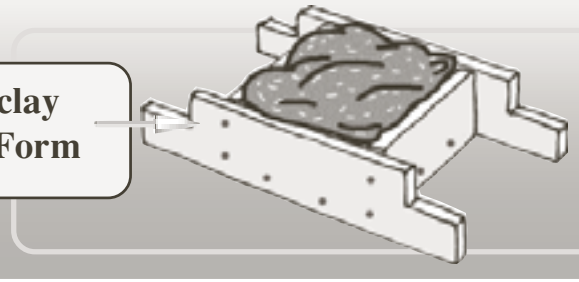
Holding the round piece of wood on the other side, nail in the long nail to hold it in place



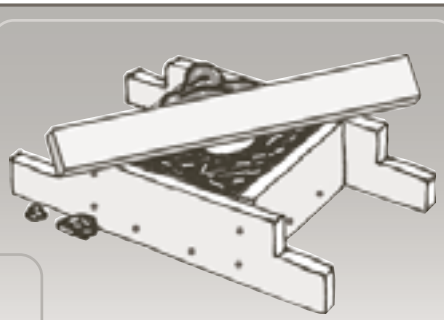
Making bricks in the Form

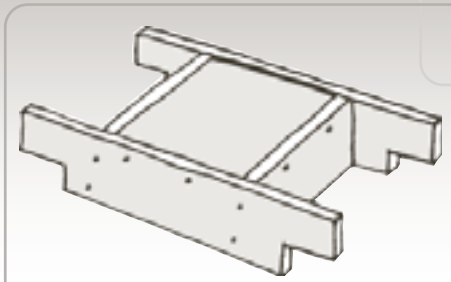
- mix the clay, husk or straw and water
- wash the form well
- scatter a little husk or straw in the form so it sticks to the wet wood

Now put the clay mix into the Form



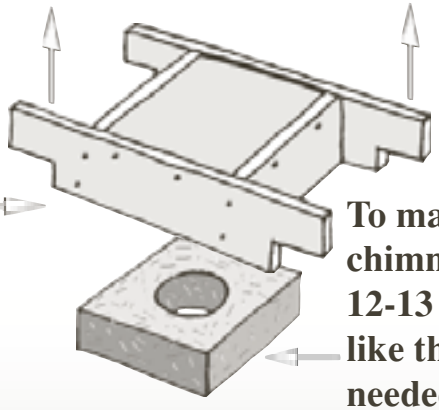
Scrape off the excess clay to make level





Turn the form upside down and tap gently

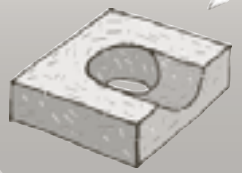
Leaving the clay brick on the ground, gently lift the form off



To make the chimney, 12-13 bricks like this are needed

Make 1 brick without a hole for the top of the chimney

Make 2 bricks looking like this



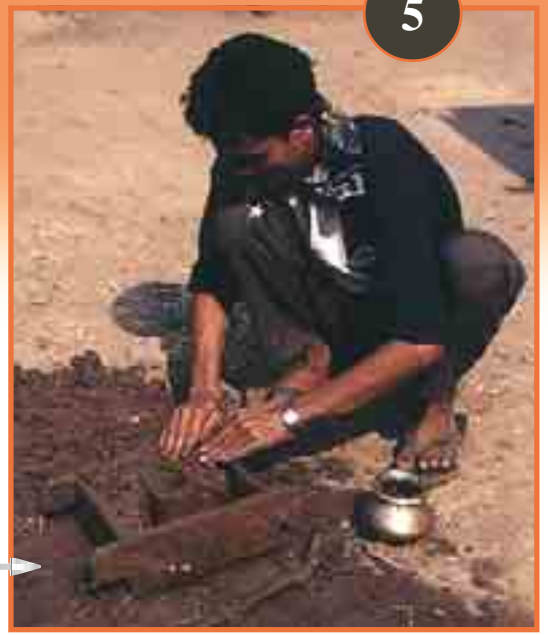
Let's see — How to make an improved stove

The form used to make the chimney

Rice husk, or chopped straw

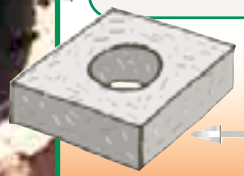
Husk or straw mixed to a thick paste

Cleaning the Form



Pressing the clay/straw mix into the form

Chimney brick after removing from the form

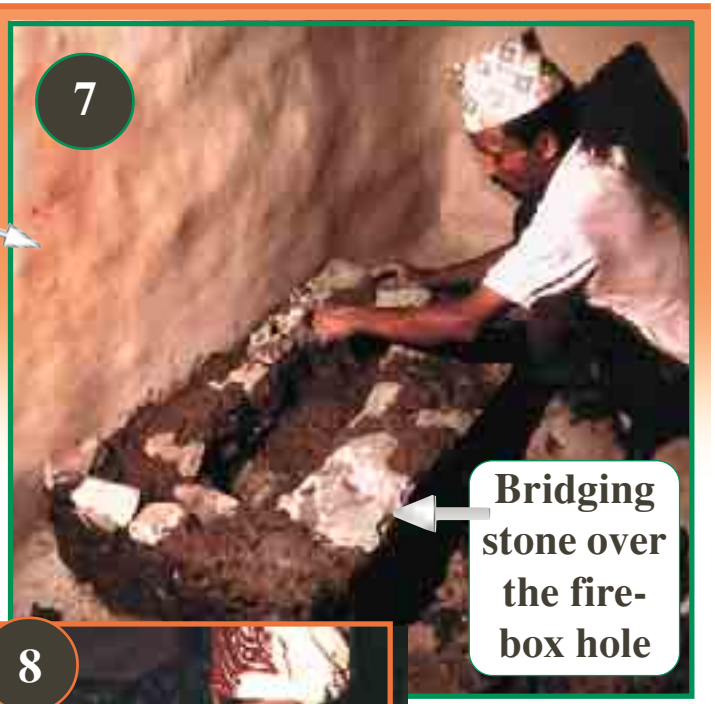


12-13 of these bricks

2 bricks like this

1 brick without a hole

Starting to build the stove



Bridging stone over the fire-box hole

Smoke leaves here

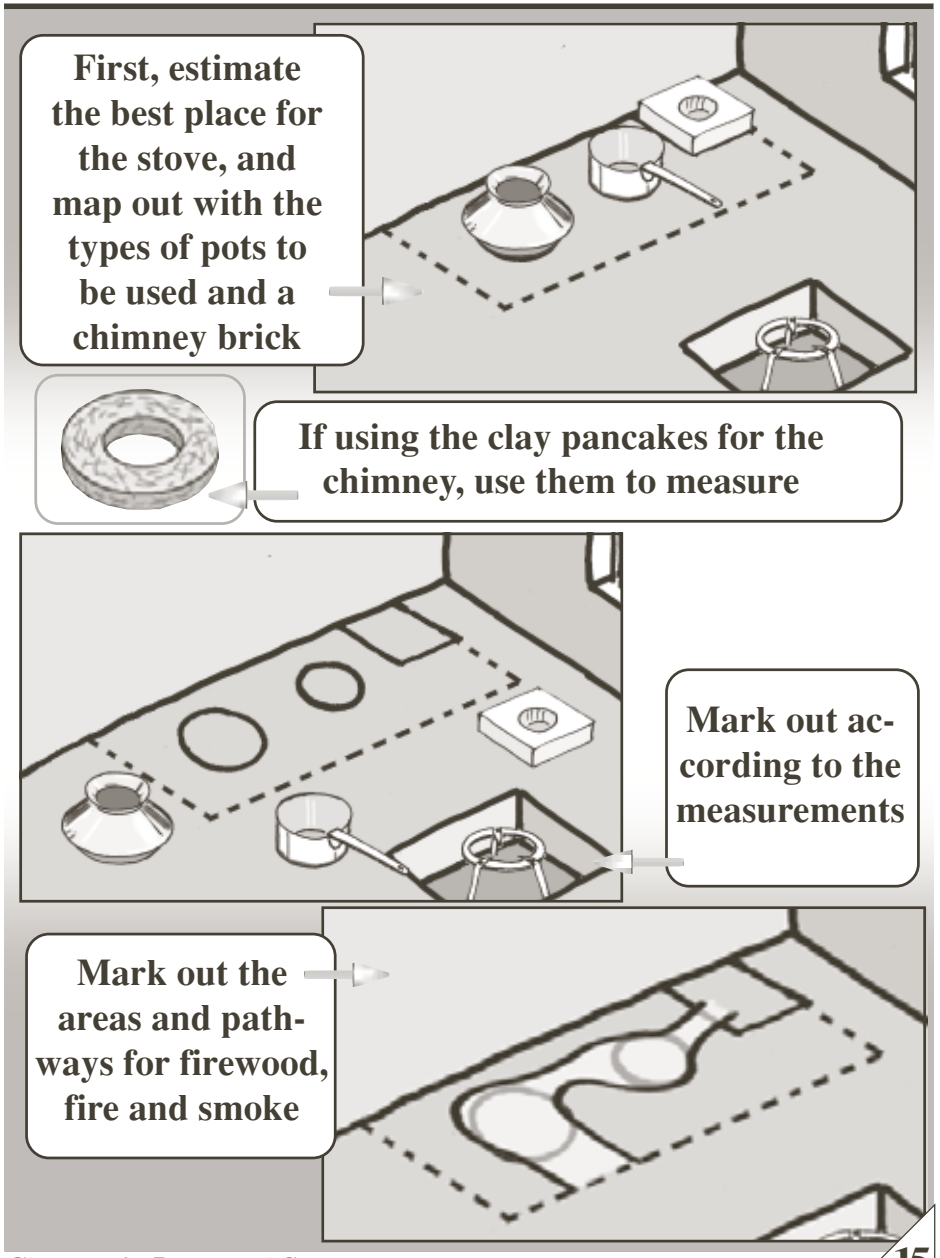
Build up the stove, leaving holes for pots and a path for smoke

Bridging stones

Red arrows show pathway for smoke

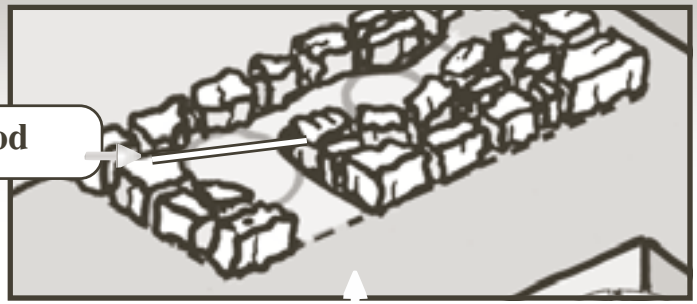
Yellow lines show empty spaces left in-side the stove

In the below pictures is the process of building the stove in drawings



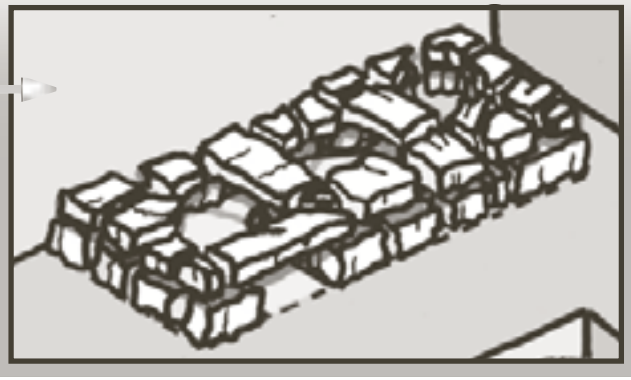
Start to build the walls according to the measurements

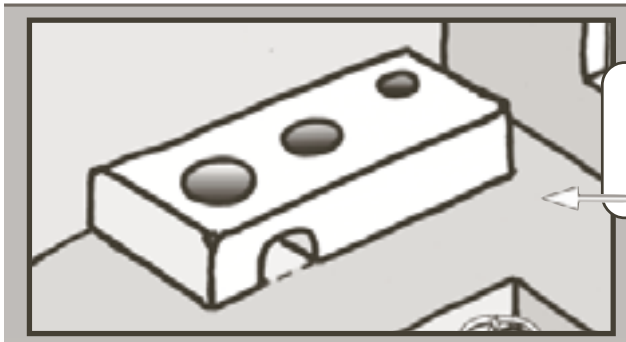
Iron rod



Use an iron rod if available. This sits inside the pot's hole and allows smaller pots to rest on it

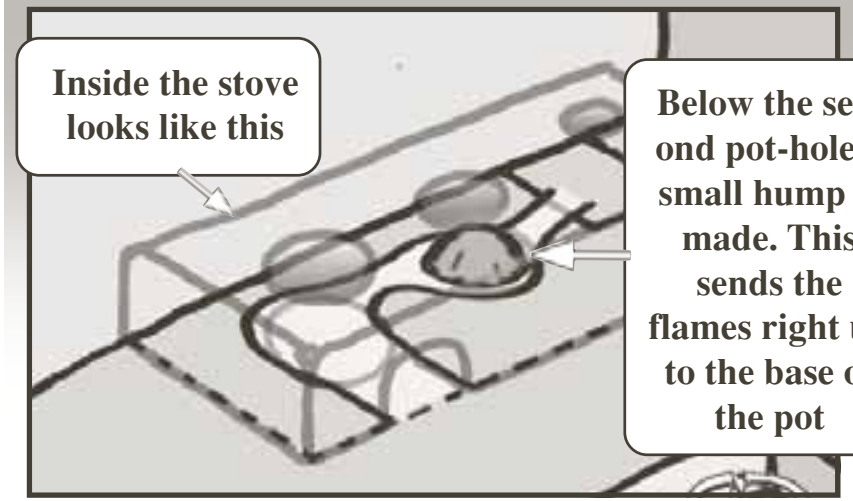
Continue to build up the walls





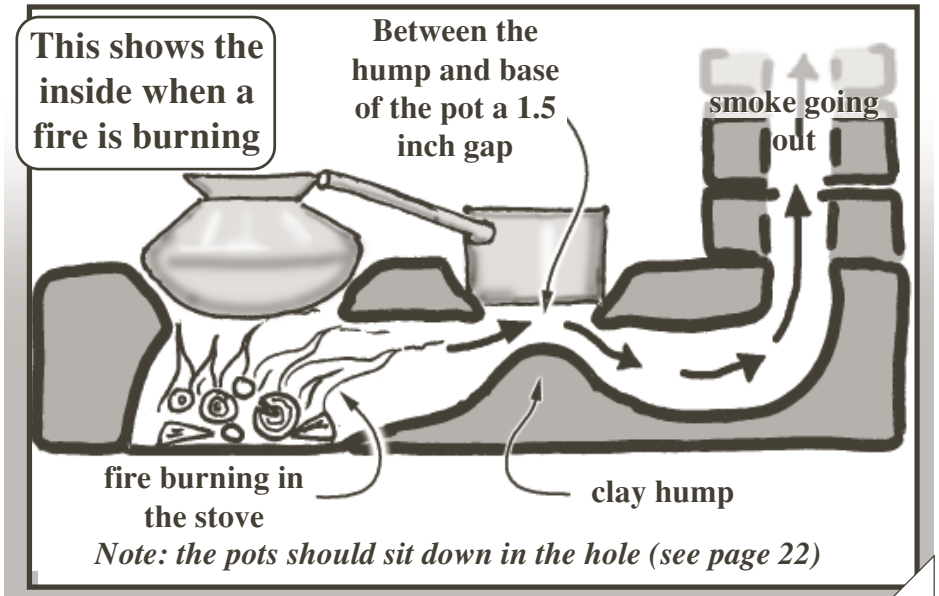
Cooking area finished

Inside the stove looks like this

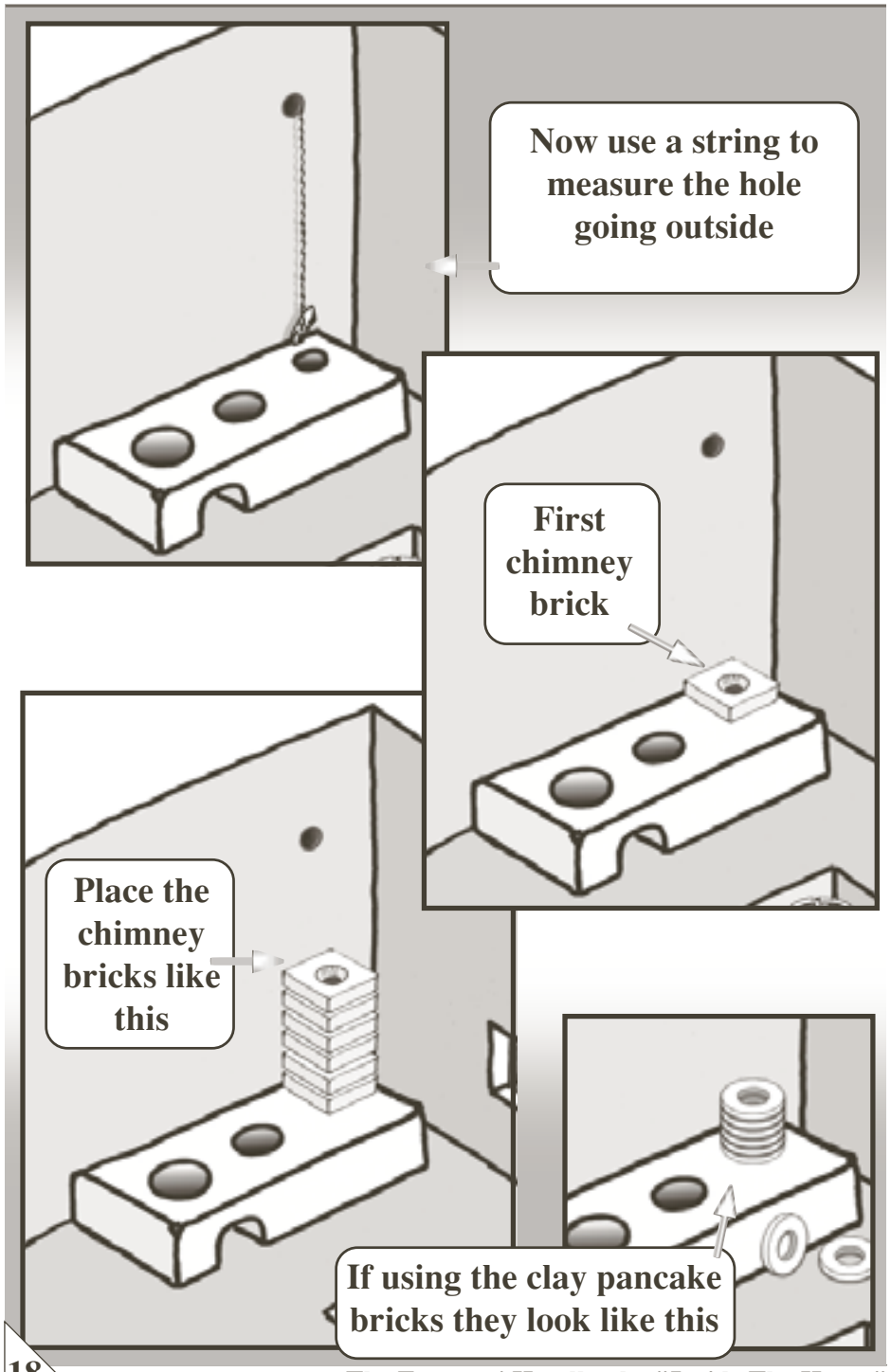


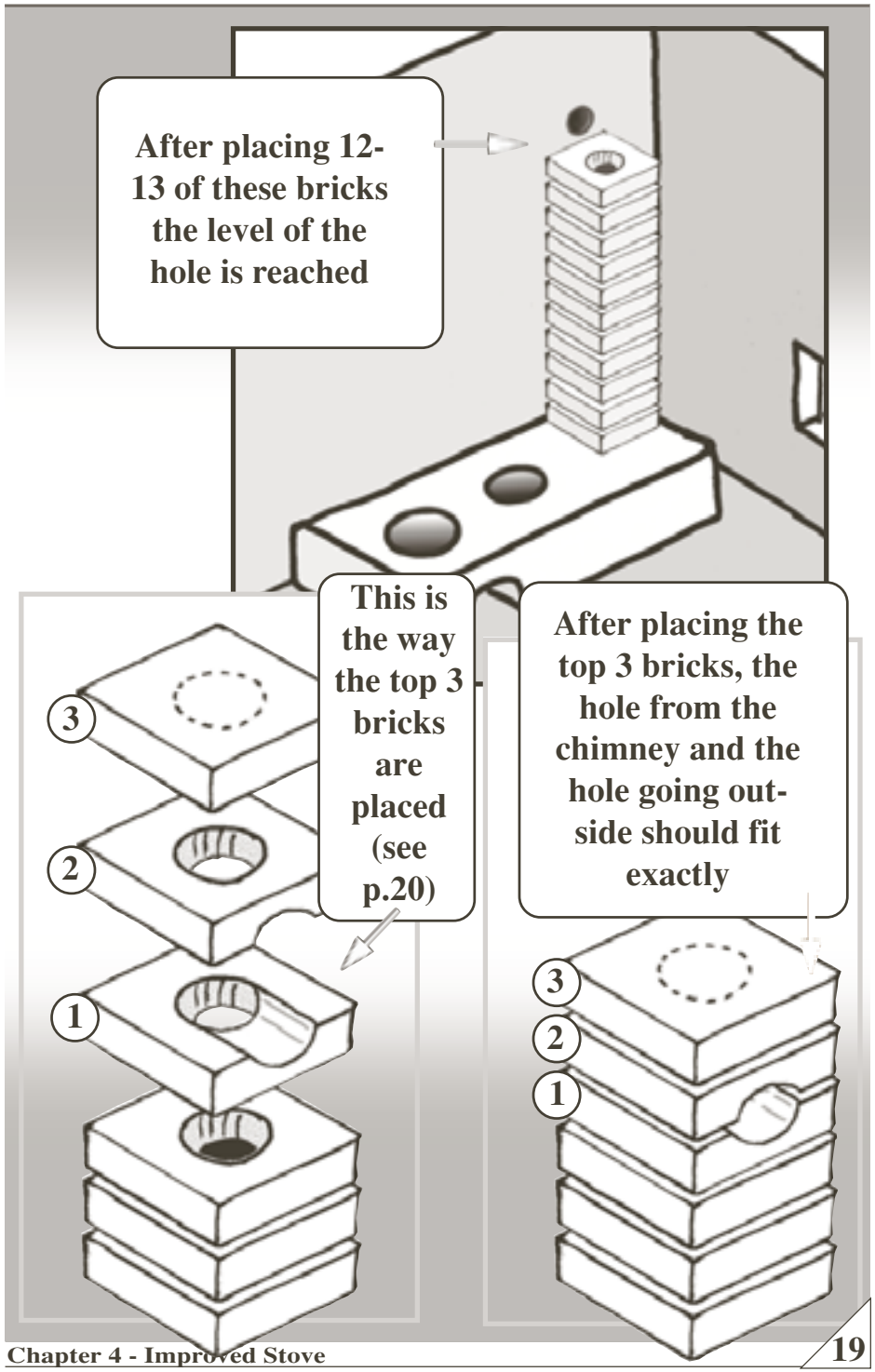
Below the second pot-hole a small hump is made. This sends the flames right up to the base of the pot

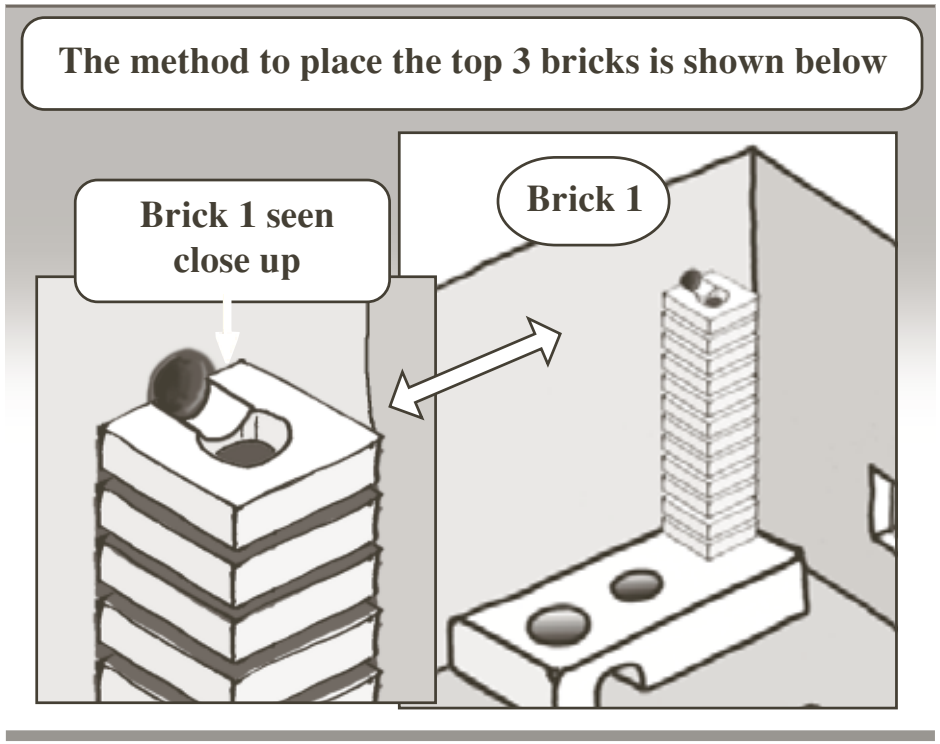
This shows the inside when a fire is burning

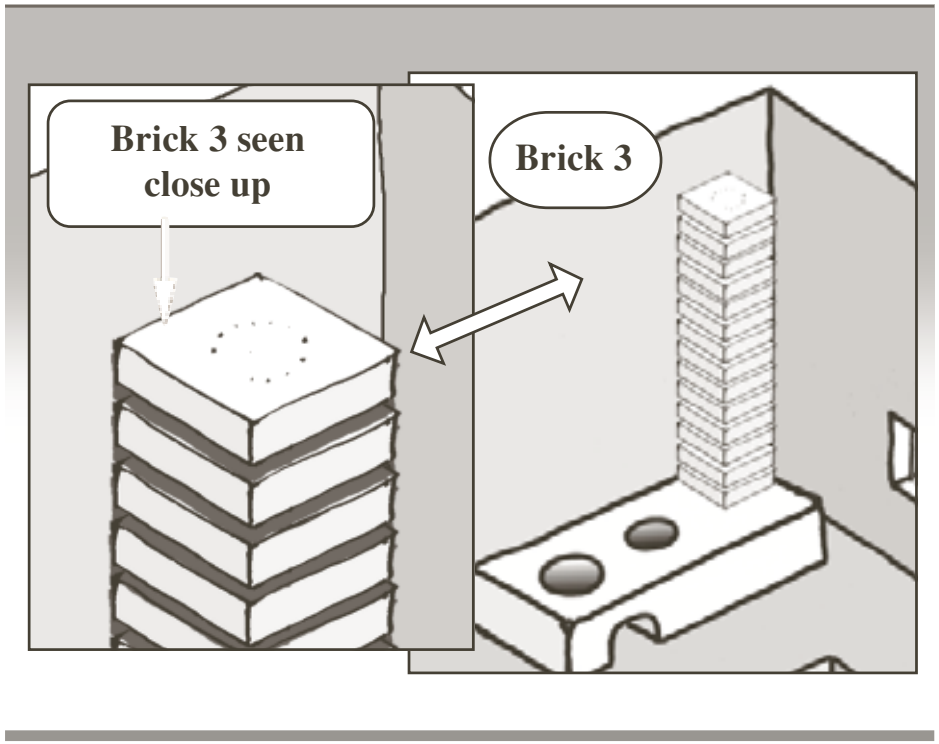


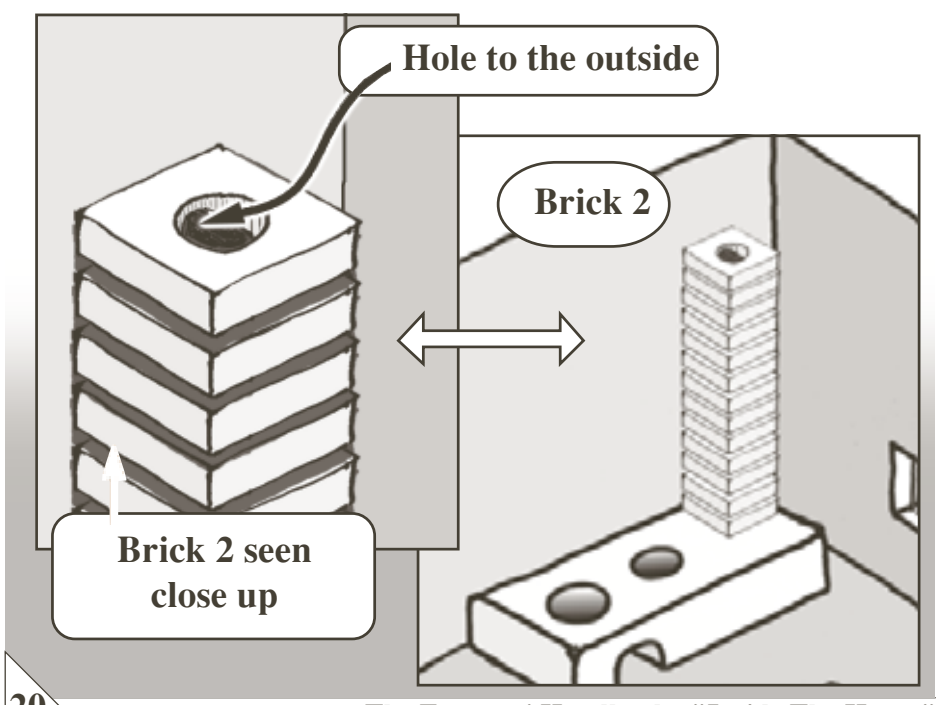
Note: the pots should sit down in the hole (see page 22)

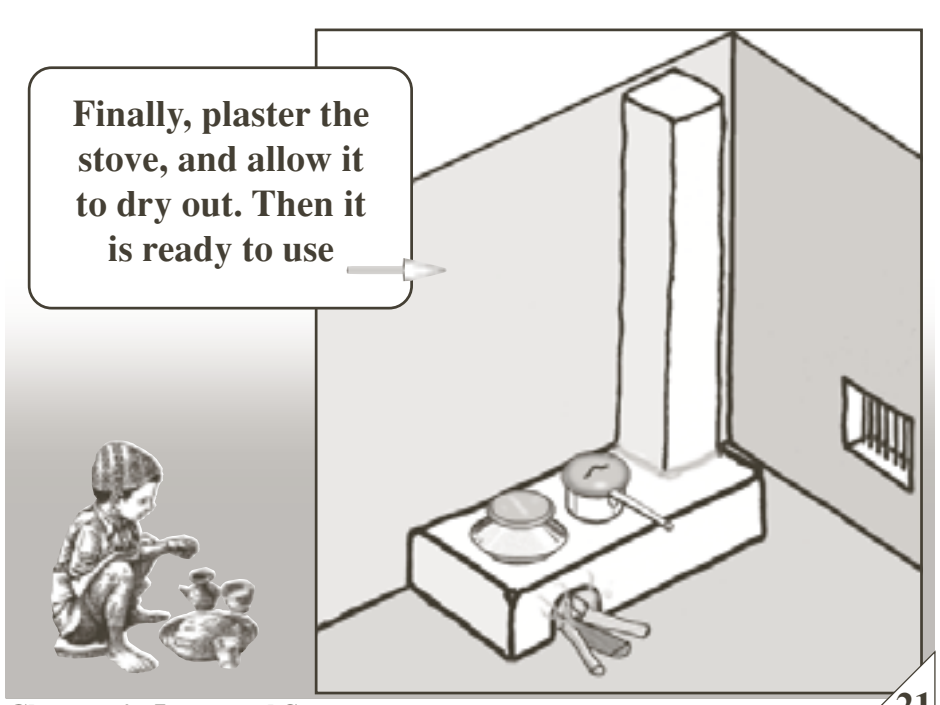

Now use a string to measure the hole going outside
First chimney brick
Place the chimney bricks like this
If using the clay pancake bricks they look like this


After placing 12-13 of these bricks the level of the hole is reached
This is the way the top 3 bricks are placed (see p.20)
After placing the top 3 bricks, the hole from the chimney and the hole going out-side should fit exactly
3
2
1
3
2
1


The method to place the top 3 bricks is shown below
Brick 1 seen close up
Brick 1


Brick 3 seen close up
Brick 3


Hole to the outside
Brick 2
Brick 2 seen close up

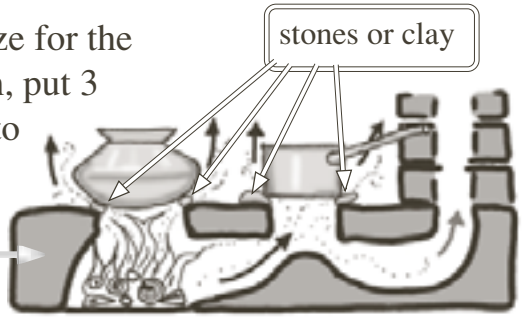

Finally, plaster the stove, and allow it to dry out. Then it is ready to use

Things to pay attention to when using the stove

In this picture the stove is being used correctly - the pot is low in the hole where more flames reach the base, and smoke can escape.

In this picture the stove is not used well - because the pot does not sit low in the hole, the flames do not reach close. In this way food cooks slowly. This is due to using the wrong size pots for the hole.

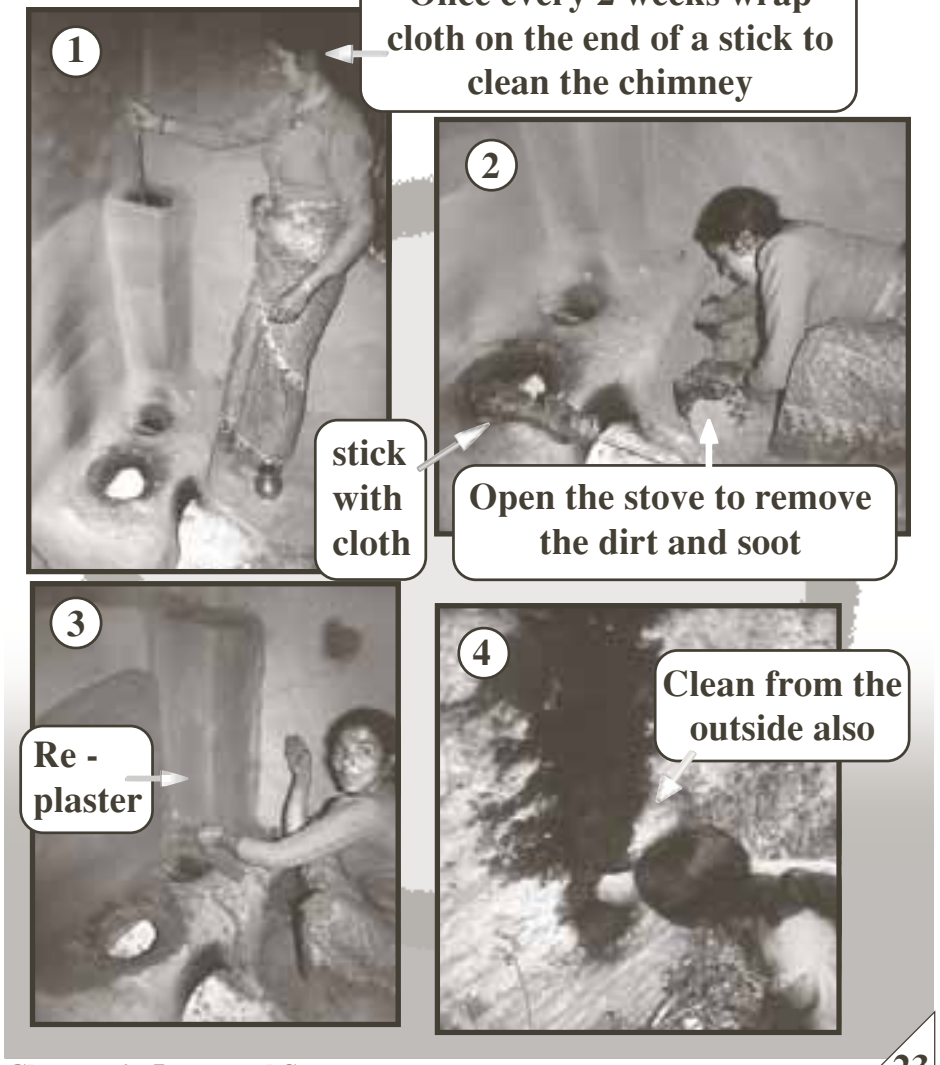
If the pots are the wrong size for the hole then, as in the diagram, put 3 small stones under the pot to draw the flames up where they heat the base of the pot. But this allows more smoke into the kitchen.



A well made stove, used correctly, will not let smoke out into the kitchen. But this can cause another problem in that the smoke helps to control various pests which otherwise can damage timber, stored grain and seed. Smoke, protects the timbers from these pests. Therefore, every few days smoke needs to be let into the house.

Cleaning the Improved Stove

- watch if smoke is passing or not
- watch if food is cooking fast or slow
- clean the chimney every week or 2 (see below)
- plaster the stove daily (do not use dung)
- measure how much firewood is used



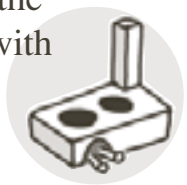
Farmers' Experience

Mrs Chitramaya Gharti Magar

Mrs Chitramaya Gharti Magar

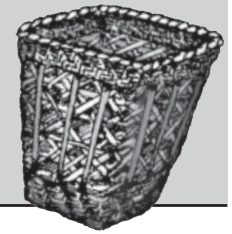
From Nepal, Surkhet district, Dahachaur - 4, and member of "Ritu Laligurans" and "Hariyali" women's group Mrs Chitramaya Gharti Magar has made an improved stove. Now let's read about what she says.

" Because smoke affects our health it's important to make the smoke go outside. In the improved stove less firewood is also used, so time is saved collecting fuel as well as helping to protect the forest. To make this stove stone, clay, rice husk and a form to make the chimney is all that's needed. We didn't have a form in our village, so I used a bowl to make 35-36 clay pancakes. The form also uses more clay. Making the pancakes needs less clay and you don't need the form, so I made up this method. There's no smoke from my stove, and it uses less firewood. Once cooked, the food stays warm a long time left on the stove. There are no flies and the food can't burn. Also, the pans don't get so black with soot. Now, I want teach others in the village how to make the stove. "



© Grihasthi Communications

What is a Hay Box?



The need of today is to conserve, recycle and use resources efficiently, and to save waste. To do this many types of stove have been developed and taught around the world, in order to save fuel in cooking.

One method of cooking while saving fuel is called the ***Hay Box***. Food such as rice, pulses andvegetables are brought to the boil on a traditional stove, and then immediately placed in a box packed with straw, and covered. The food continues to cook even though it is not on a stove, because the heat in the pan is enough to keep cooking the food, while the box and straw stop the heat from escaping. After some time the pan is removed and the food is ready to eat.

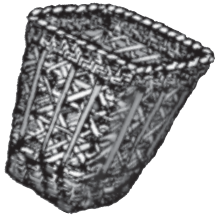
In this booklet we describe how to make and use a hay box out of locally available resources, to conserve fuel use in the home.

A pan of cooked rice taken out of a hay box

Why Use a Hay Box?

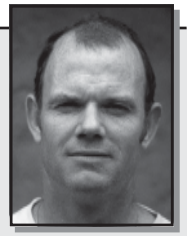
Advantages of using the Hay Box

- Food can be cooked with less fuel (wood, kerosene, gas, electric, etc.)
- Because food is not boiled for a long time, many vitamins are saved
- Because pots are in the flames less, they last longer
- Less time is spent cooking, so there is more time for other activities
- The hay box can be made from local resources
- It doesn't require much skill to make and use.



Once the traditional stove has brought the food to the boil, the packing of the hay box (hay, straw, wool, cottoon, etc) keeps the heat in and this is enough to keep the food cooking. This may take 10-20 minutes longer than if using a direct flame. In this way, for example, rice is brought to the boil, packed in the hay box and covered. It will continue to cook itself and will be ready in about 20 minutes longer than on a normal fire.

This booklet's author
Chris Evans, advisor,
Himalayan Permaculture Group, Nepal
www.designedvisions.com



How to make a Hay Box ?

You can make a Hay Box in your own home for your own use. There's no need for any special skill. In this booklet we show how to use a traditional bamboo basket to make the "box". But instead, a wooden box, cardboard box or even an old fridge or drum can be used. The size of the "box" should be about 4-6 inches wider than the width of the pot. Because in Nepal the bamboo basket is available everywhere, we find this easiest to use.

Materials needed to make a Hay Box

Method

Straw, hay etc. is packed tightly into whatever type of box or container is available. While packing, leave enough space for the size of pot you will be using. Keep some straw aside to cover the pot later. Keep a towel or blanket ready. The box is now ready for use.

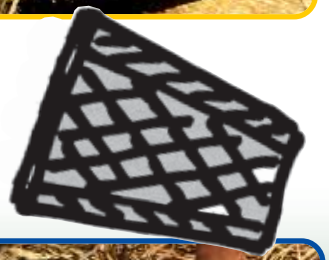
Instead of straw, dried grass, wool or cotton can also be used.

Once the box is ready, the cooking can begin in the kitchen. Start to cook your usual food, such as rice, vegetables, etc., on your traditional stove, as you would normally do.

In the pictures on the next 4 pages we use the example of cooking rice in the hay box. But whatever food you are cooking, use the stove just to bring it to the boil. As soon as the food is boiling it is removed from the stove and placed in the hay box.

Let's see How to make the Hay Box

Pack straw tightly into the bamboo basket. Instead of straw, dried grass, wool or cotton can also be used.



While packing, leave enough space in the basket for the pot to be placed.

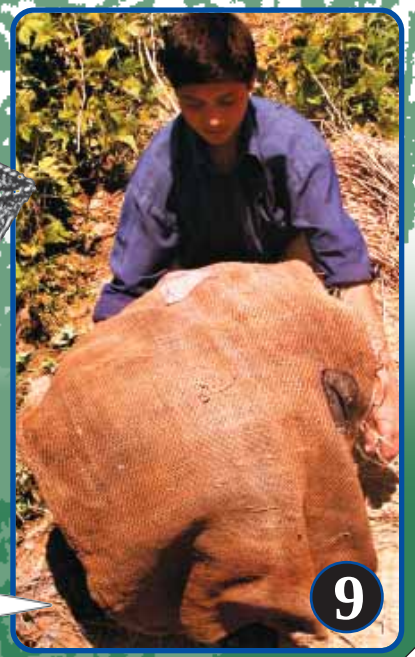
In the kitchen, start to cook your usual food in the usual way.

In a few minutes the food will start to boil. Then, cover the pot and remove it from the stove.

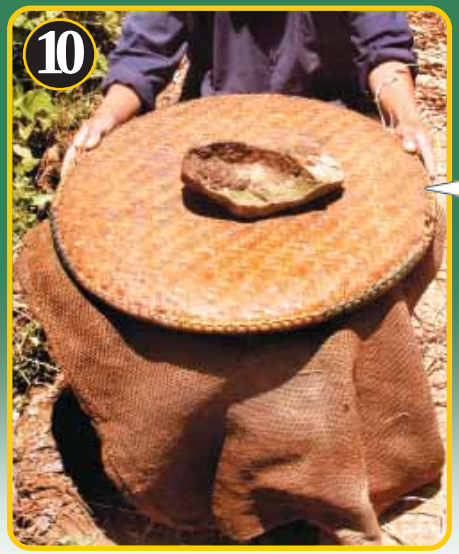
Then completely wrap the pot in a blanket or towel.

Place the wrapped pot in the middle of the packed straw.

Pack more straw on top to completely fill the box.



Cover it all with sacking or a blanket.



Finally, place a rock or heavy object to weigh down the lid.

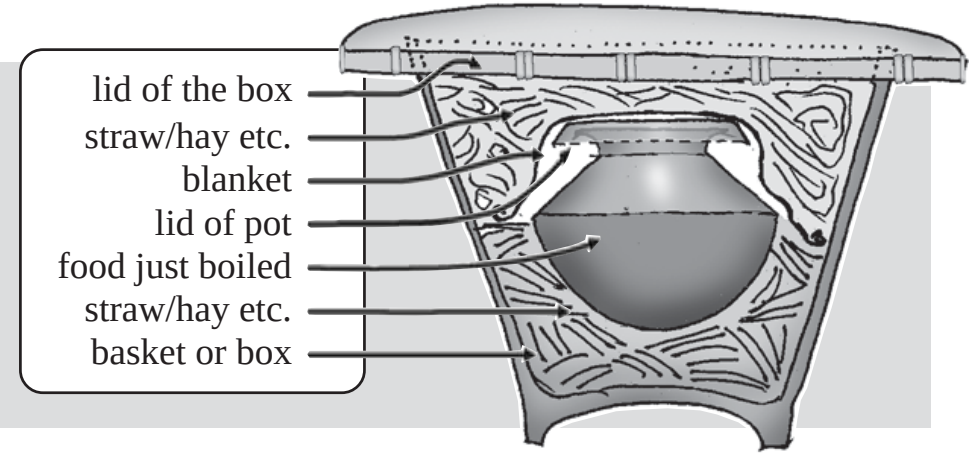
In 20-30 minutes the food in the pot will finish cooking by itself. After this, you can remove the food whenever you are ready to eat.

Here the rice is cooked perfectly.

Maintenance

How to use the Hay Box

After a short while the food in the pot will start to boil. Then, cover the pot and take it off the stove. Then, completely wrap the pot in a thick towel or blanket. Put the pot in the middle of the packed straw. Cover it with more packed straw to completely fill the box. Cover the box with a lid, and finally place a weight on the lid.



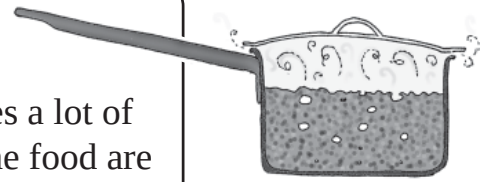
The food will cook by itself inside the box in 20-30 minutes. After this, you can remove the food to eat, or you can leave it there for 3-4 hours or until you are ready to eat, and it will stay warm.

Inside the box with its lid and tightly packed straw, food cooks and stays warm for a long time. It works in the same way that freshly boiled tea is kept hot for a long time inside a thermos flask.

Another benefit of using the hay box is that because the food is not boiled for a long time, vitamins are not lost in over-cooking, so the food is more nutritious.

Another way of saving fuel in cooking

Just by keeping the lid on the pot while cooking saves a lot of fuel. Nutrients in the food are also saved.



Good Food & Healthy Family

Whose Responsibility ?

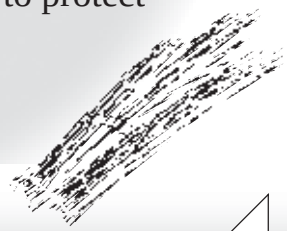
Farmers' Experience

Mrs Shivakala Rokaya

From Humla district capital Simikot Mrs Shivakala Rokaya is a member of Jolimungra Vegetable Growers Group. She's made and used a hay box - let's read about her experience.

Mrs Shivakala Rokaya

"I find this hay box really easy to use and very beneficial. I can start cooking then go off to the fields or the forest and just at the time when I start to feel hungry come home and the food is ready, hot and fresh in the hay box. I boil the rice in the pot and skim off the excess water, then wrap the whole pot with rice and lid in a thick cloth and place inside the hay box, and it's cooked in just half an hour. I reckon that it saves about the same amount of fuelwood that I'd use to cook the vegetables each meal. I really like methods like this, that can make our lives easier as well as helping to protect the environment"



Read On !

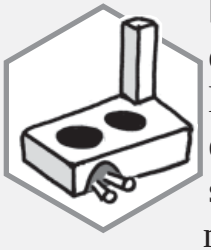
Subjects Related to the Hay Box

Good benefits can be had from the information in this book about the hay box. However, this information is also linked to other methods. For extra benefits let's read, learn and practice from other related chapters.

Hay Box Chapter

Improved Stove Chapter

In Nepal 95% of households use firewood for cooking food. Everyone knows the effects of too much smoke in the kitchen but what to do ? Now let's learn about an easy and successful method.



Diet and Nutrition Chapter

Many diseases can be prevented by a healthy diet, In this chapter, information is given about the benefits provided by different types of food.

Grihasthi Communications