

FOOTSTEPS

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FOOD SECURITY 

Rural women and food insecurity

by Drs Neela and Amitava Mukherjee

FOR THE 350 MILLION PEOPLE in India who live below the poverty line, food security is literally a matter of life and death. Agriculture supports nearly 70% of the population in India, most of whom own less than 2 hectares of land.

We believe that a household or community or nation is food secure if:

- culturally acceptable food is grown and available
- people have the ability to buy food
- people are free to choose to buy available food
- available food has good nutritional value.

There are three main kinds of food available to small scale farmers:

- foods which can be gathered without cultivation
- food from traditional methods of cultivation – low input farming

- food from intensive, modern methods of farming (using fertilisers, pesticides and modern mechanisation) – high input farming.

In the last two decades, production yields of food grains (such as wheat, rice and maize) from high input agriculture have increased by an astonishing three or four times in India. However, yields for low input agriculture producing crops such as pulses and gram, the main source of protein for the poor, have decreased.

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This is leading to a change in food habits. Traditional cereal varieties are disappearing as rice and wheat take over the markets. Even the local varieties of rice and wheat are also becoming scarce. This means that the first condition above – that culturally acceptable food is available – is rapidly disappearing. High input agriculture is leading many small farmers into debt as they try to buy the necessary inputs. The second condition is also therefore under threat as farmers' ability to buy food is reduced.



FOOTSTEPS

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TEAR FUND 
CHRISTIAN CONCERN IN A WORLD OF NEED

Food security means that people should have the freedom and ability to buy culturally acceptable foods.

Women are often the worst affected as food security deteriorates. They may have to spend long hours working outside the home to raise extra money to buy food. They have the pressures of managing the distribution of food within the family and are most likely to go without food themselves so that their children get enough.

Food gathering provides food both for eating within the home and for sale. This type of food often contains vital vitamins and minerals. During famines, droughts or other disasters it is a valuable source of food, which is why it is also called 'hunger food'.

Few records reveal how much food is actually gathered. Studies by N S Jodha (1986) in arid areas of India found up to one third of people's food requirements were being met from this source.

Research into changing food security

Other research has confirmed that it is mainly women who manage household food supplies and use wild or gathered foods to supplement food supplies. The recent rapid rises in grain yield in India do not reflect a similar improvement in

food security for the poorest in India. This can be clearly shown by research in the village of Krishna Rakshit Chak, Midnapore District, West Bengal. Villagers belong to the Lodha tribe and are mostly poor, landless labourers.

Participatory exercises were carried out with the women in Krishna Rakshit Chak to discover:

- their knowledge of available wild foods
- their role in the collection of wild foods
- the seasonal availability of all foods
- how the availability of wild food has changed over time.

Women were asked to prepare seasonal calendars of food availability and variety. Using small stones, they showed the availability of foods throughout the year and the amounts available. They then used different kinds of leaves, sticks and twigs to show the availability and consumption of various gathered foods. Here, the amounts consumed were simply estimates.

Researchers then returned just over two years later in 1995 when the women were again asked to make a calendar to indicate any changes which may have taken place.

Results

Women keep track of the different wild foods available. They are usually responsible for gathering food and for its preparation.

Both seasonal calendars revealed long periods of hunger. This is despite official government statistics showing record harvests from high input agriculture and large government food stocks. In 1995 the hunger periods were even longer and more severe. It appears that despite official statistics to the contrary, poorer people faced even greater food insecurity in 1995 than in 1993.

Villagers preferred rice as the main staple food. Their consumption of rice varied according to its availability and price and their own ability to find work and earn income. After harvest (Arghayan and Poush – mid November to mid January), prices are low and supplies are plentiful. This was when most rice was eaten. The price of rice was the most important factor in whether they chose to buy rice or another staple food.

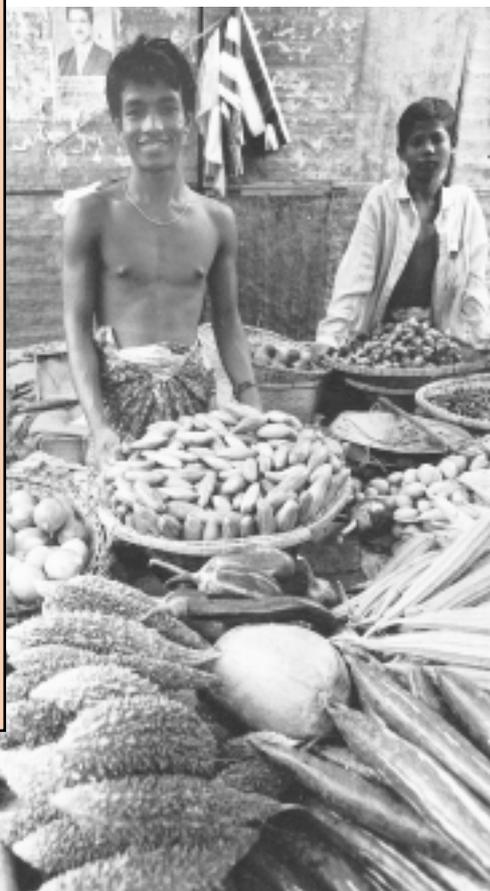


Photo: Richard Hanson, Tear Fund

Villagers were easily able to find work during harvest times and usually afterwards in threshing, winnowing and husking the rice. As rice prices are low at this time and income was usually available from casual work, villagers would buy as much rice as possible for the next few months.

As farm activities finish for the season, villagers make a living by selling fish and firewood and use up grains bought previously. Later in the year life becomes more difficult, the price of staple foods rises and there are many months of persistent hunger when people depend heavily on food gathering. Between 1993 and 1995 the length of the hunger period increased from 5 months to 8 months. In 1995 the amount of wild and gathered food available had reduced.

When villages were asked why the amounts of gathered foods (which had

included snails, pumpkin, bitter gourds, spinach, leaves, herbs, green bananas and wild water plants) had reduced in 1995, their explanations were fascinating.

First they said that in 1993 they had free access to the fields of relatively well-off farmers who let them gather foods they did not plan to use. However, these previously well-off farmers were now struggling to make enough money and had begun selling these hunger foods in the local markets.

Secondly they mentioned that the area of common land is shrinking fast. Common lands are now being used for purposes such as social forestry. This means that women and children have to walk greater distances to gather wild foods.

Conclusions

Despite official reports of 'record food harvests' and supposed growth in the economy benefiting all households,

hunger has increased in this village. The loss of access to wild and gathered foods has lengthened the hunger periods and removed a safety net provided by nature. The state had helped by digging ponds for fish farming and irrigation. However, this tended only to benefit landowners. The need to help with survival strategies for the landless and poorest in society remains an area of major concern for this community and for many others.

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EDITOR

Could you try out similar participatory exercises in your area to help understand people's needs and their food security situation?



FROM THE EDITOR

PLANS FOR THIS ISSUE began with the theme 'storing the harvest'. But then we felt it important to widen this subject to that of food security which raises many more issues. A useful definition of food security comes from von Braun (1992): 'Access by all people at all times to the food required for them to lead a healthy and productive life'. With over 800 million people in the world today known to be hungry, some 190 million children known to be underweight, 230 million children known to be stunted in their growth, let alone the 2 billion people at risk from micro nutrient deficiencies – it is quickly clear that a huge proportion of the world's population does not enjoy food security.

Three quarters of people coping with food **insecurity** live in rural areas. Drs Mukherjee highlight the situation of tribal villagers in India, no doubt similar to that of rural areas in other parts of the world. From Africa we have some guidelines for grain banks and ideas on running workshops to look at local food security. From South

America, Miges Baumann raises concerns over fast-disappearing traditional crop varieties.

Traditionally, men are often responsible for the main granaries of the household, while women manage the day-to-day food supplies. Women struggle with their daily fears of failing to provide adequate food from available supplies. Women are more likely to spend any earned income on meeting immediate family needs than men. We look at both grain storage and food preservation, providing some practical and simple ideas.

Food security is an issue often discussed at government level or at numerous international conferences. However, we believe food security is most likely to be achieved when food is **locally produced, processed, stored and distributed**. There are many other topics we could have included but hope we have provided enough useful ideas to start you thinking. We would encourage you to follow the ideas shared by Pukuta Mwanza and set up discussion groups or workshops in your village or urban community to discuss local food security issues.

Isabel Carter

Community grain banks

by Pasteur Samuel Yameogo

BURKINA FASO is a land-locked country in West Africa with only one short rainy season. There are often severe food shortages in the drier northern areas. Since the 1980s when



The bank opens its doors only when food shortages begin.

there were several years of famine, community grain banks have become popular throughout the country, providing a village-based solution to critical food shortages. Grain banks make food supplies available at the hardest times of the year at carefully controlled prices. ODE has supported the setting up of more than 100 grain banks.

The north-east of Burkina Faso is on the edge of the Sahara Desert, with sparse vegetation. The rainy season is between June and August. During this time, the lack of bridges makes roads impassable. The region therefore becomes isolated for several months each year. Food supplies cannot be transported from outside and commercial traders often exploit the resulting grain shortages, sometimes even inventing food shortages just to raise market prices. They control the markets, selling grains at high prices. Ateli and Matiacoali are examples of villages in this area.

Encouraging women's committees

Women's groups with grain banks are usually less developed than those managed by men. The collection of grain often involves long journeys to other regions which have surplus grain, which is not easy for women. However, women's committees have a number of advantages...

- Management committees are usually village-based because women travel less.

Case Study One: The Matiacoali Grain Bank

Matiacoali is a large village with 3,200 people, situated on the edge of a tarmac road. It has a market used by more than twelve villages in the area. Food prices soar during the rainy season to well above what households can afford. This situation led to the forming of an association of women in the early 1990s to fight against the evils of food insecurity.

In 1992–3 a famine in this region brought in ODE to set up and run an urgent aid operation. During the famine, ODE sold grain at an affordable price (about one fifth of the market price). After the famine, money from this sale had to be used on a project to improve food security. The request of the women of Matiacoali for a grain bank was accepted.

A storehouse was built with the participation of the women's association and a management team was selected for training. An ODE loan allowed them to stock 25 tonnes of grain.

Operation

Since 1994, the women's group of Matiacoali has stored grain for the critical periods of the year. Straight after harvest time, from December to February, the group tours the markets of the area, discovering where the price is best and stocking up the bank. Grain is sold in July and August, at prices everyone can afford, among the group's members and the most needy households of the village. Two repayments of the loan have already been made. Since their initial training from ODE, the management committee have gained much practical knowledge and are now taking greater control of their own project.

Some problems

- A very good harvest in 1995 meant there were problems in selling all the grain, as people still had their own supplies. This meant the group had to sell part of its grain at purchase price to its members, reducing their profit margin to nothing. This made repayment difficult.
- The negative influence of certain members reduced the overall motivation and achievements of this group.
- The large size of the village makes the demand for grain difficult to satisfy, but at least the group can help part of the population.

Some solutions

- A new management committee has been appointed, which should improve motivation.
- The funds available for buying stock are still at a good level, but will be much weaker when the group finish repaying the loan. ODE has provided fresh credit, with lower interest this time. This may help them to increase their stock level so more people benefit from the grain bank.

Successful grain banks

Key points

The community must make the decision to establish a grain bank themselves. Outside agencies should never make this decision for them. The community must own and control the grain bank. A committee to manage the grain bank needs to be democratically elected. Outside experts may be needed to give advice on purchasing grain, preservation and marketing of the grain and how to manage the store.

Community grain banks should not be seen as famine relief as this will create a sense of dependency. Rather, they should be seen as the community taking active steps to improve their own food security.

Appropriateness

The community grain bank provides one workable solution to food security problems...

- It is simple.
- It is locally managed by those who benefit from it.
- It does not require external technical support.
- It is initiated at grassroots level.
- It is participatory – those who benefit share in all levels of decision making.
- It does not create dependency, but instead promotes community ownership.
- It costs a small amount to establish.
- It is long lasting.

Food will be available at the crucial times when farmers and their families need it most. This means farmers will not be forced to work for cash just when they need to spend time on their land.

From information supplied by Moise Napon, Director of CREDO, a Christian development agency. His address is: 01 BP 3801 Ouagadougou 01, Burkina Faso.



Case Study Two: The Ateli Grain Bank

Ateli is a village of 1,000 people. The men of the village set up a group in 1982 during a time of famine. One of their objectives was to unite in the struggle for food self-sufficiency. The community grain bank project was begun in 1986 to improve food security. The group asked for help from ODE who agreed to provide the necessary credit to begin work. A well-built community grain store was constructed with the full participation of villagers.

Operation

A committee was selected to look after the management of the grain bank. Ateli chose well, forming a dynamic committee. They received training from ODE in grain storage and marketing. ODE provided credit to enable the purchase of grain at the end of the harvest season when prices are low. The credit was divided into two instalments given over two successive years, in order to reduce risk in the first year. Ateli purchased 5 tonnes of grain in the first year and 5 tonnes in the second year.

Since 1988, Ateli has stored several types of grain in its grain bank. Grain prices are fixed by the village group to provide a balance between the low grain prices at the end of harvest and high grain prices charged by traders later in the year. When food is in short supply, grain is sold to villagers on a regular basis. Ateli has been able to pay back the loan in just four years.

Impact of the project

The villagers of Ateli have welcomed the grain bank warmly and understand the advantage of safeguarding their grain. During the three rainy months of the year, households easily survived the period of shortage thanks to their grain bank.

Some problems

- One difficulty has been bookwork. In this rural environment, the majority are illiterate. Management of the grain bank requires good record keeping.
- If grain is given on credit to help people during the most difficult periods, this brings the problem of recovering debts, which demands much patience on behalf of the committee.
- Since the loan was repaid, the bank can only operate with the slight profit they made during the five years of credit. This means they have difficulties buying enough grain in advance for all village households.

Some solutions

- The churches played an important role in teaching literacy and numeracy to enable better record keeping.
- To increase the buying power of grain banks, ODE offered to grant a fresh loan to all well-managed grain banks, which included Ateli.
- ODE will continue to provide some follow-up and support for committees, even after loans are repaid, until they judge the organisation is sufficiently in control of the entire project.

- Women are more 'transparent' in their financial management.
- Women have better skills in the management of food supplies, especially in times of crisis.

Conclusion

ODE are well satisfied because we feel that the main objective – of improving local food security – has been achieved. The experience of Ateli and Matiacoali reinforces our view that such small organisations can be very effective once they are aware of the problems of food

security and united in finding solutions. Providing credit, training and technical advice is sufficient to enable them to manage their own food security. However, there is still a need to develop and build on experience.

Pasteur Samuel Yameogo is Director of ODE, a federation of evangelical churches in Burkina Faso committed to economic, social, cultural and spiritual development. ODE, 01 BP 108 Ouagadougou 01, Burkina Faso.



Urban agriculture

MARKET GARDENERS in the Boma area of lower Zaire are not economically strong. We used the INADES lessons as a group and realise that we need to market ourselves more positively to improve our situation. We need to improve our production of vegetables but we also see other important areas:

- We do not preserve our produce to sell at the right time when prices are high.
- We lack storage facilities.
- We lack knowledge about appropriate preservation techniques.
- Some members need cash urgently and cannot store crops.

We are unable to sell our vegetables for a good price because:

- We have no control over the prices.
- We are not well organised.
- There is competition from imported vegetables such as onions.
- We lack transport.

We see the need to organise ourselves in groups with clear aims, trust in other members and common goals. Then we can work together to buy tools, build storage facilities, improve sales and transport. We would like to hear from other groups who can share advice with us.

Gédéon Mbenza Panzu
AMIP
BP 23
Kalamu, Boma 2
Zaire

Biogas production

FEW PEOPLE in our rural community here are aware of the environmental damage caused by continuous cutting down of trees. The few who do plant trees plant eucalyptus which is not good

for soil fertility. This deforestation is causing the extinction of medicinal plants and a lack of firewood.

Our small group is building tree nurseries and encouraging tree planting. Can anyone help us with information on small-scale biogas production to help reduce the number of trees being cut down?

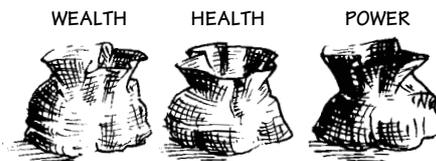
Ngah Edward
Citex Farmers
G H S Kumbo
PO Box NSO – NWP
Cameroon

EDITOR

People are often very aware of the environmental damage caused by removing trees. However, their need for cash from selling wood or charcoal may force them to do this.

Ideas for health training

I'D LIKE TO SHARE some training activities which I have developed with the help of village people to encourage discussion on health and nutrition.



BAGS OF HAPPINESS

Choose just one 'bag of happiness' (see above). Then give a reason for your choice. This helps to show the importance of health to people.

YESTERDAY, TODAY, TOMORROW?

Make three charts and encourage people to discuss the important things that keep them healthy:

Days gone past For example: traditional healers, herbal medicines, traditional foods, taboos, traditional religious festivals etc.

The present day For example: many of the above, health workers, clinics, medicines.

Tomorrow? Encourage discussion about things which are changing – new and more processed foods (rice, pasta, flour), cost of medicines and health treatment, the passing of traditional skills in herbal medicines, the ending of taboos and traditional religious festivals. Is 'progress' going to improve people's health or are we losing too many

beneficial customs, eating habits and herbal medicines?

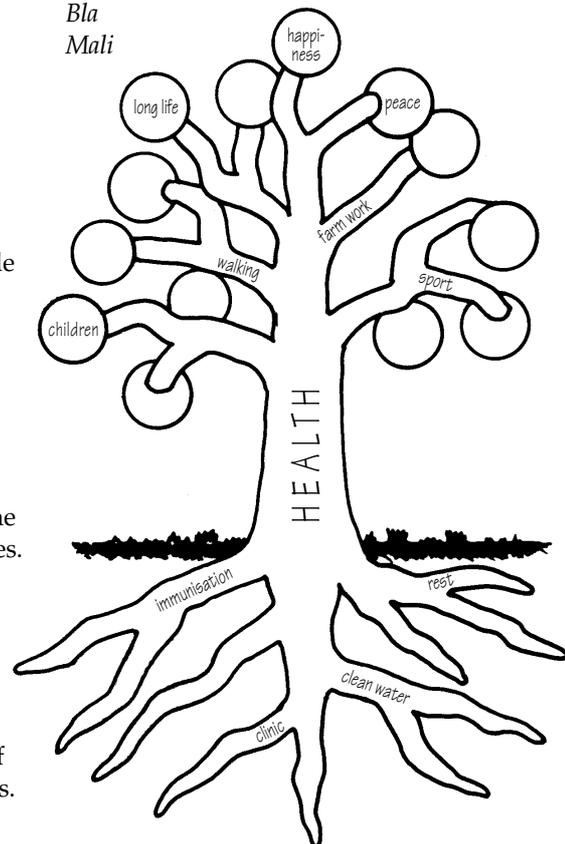
THE TREE OF HEALTH

People understand that the roots feed a tree and help it to grow and produce fruit. Here is a simple exercise to underline the importance of good health.

- Discuss what roots are needed for the Tree of Health to grow properly and write them in. For example: nutrition, clean water, rest and leisure, protection of mothers and children, preventing illness and health education. The roots feed the tree and help to keep it in good health.
- The branches of the tree are the various activities that can be done when you are in good health. For example: work, walking, preparing food, playing sport, collecting water, dancing and grinding grains.
- The fruits of the tree will be all the benefits that this brings. This could include happiness, prosperity, more income, long life, healthy children, peace.

I hope readers will find these helpful.

Madame Aïssata Guindo
Training Centre for Rural Leaders
Dougouolo
Bla
Mali



Family planning – an issue for governments or God?

RECENTLY I visited my rural home in Western Kenya where I talked to various individuals about the issues of family planning. Many families here have ten or more children. For many Christians this seems a controversial issue. Some blame the State for failing to meet the needs of its people due to mis-use of funds. Some complain that huge sums of money are spent on sex education and condoms which can encourage sex among young people.

In Genesis 1:28 we read of how God told man to be fruitful and increase in number, fill the earth and subdue it. Children are a blessing to God. He knows them before they are born (Jeremiah 1:5). But through the wisdom and knowledge he has given us, we now know that the earth is filled up! If we reject this understanding we will also ignore our children's future (Hosea 4:6). The question is – are street children, land shortages, hunger, drug abuse and violent crimes increasing because of over population? Are we waiting foolishly for God to rub out the verse in Genesis while we are being destroyed for our lack of knowledge and understanding?

Hezron Sande
PO Box 60954
Nairobi
Kenya

Mushrooms

SEVERAL YEARS AGO I got interested in growing mushrooms. I obtained a manual but my interest soon cooled when I discovered I would have to learn about soil acidity, temperature, sterility of growing medium and spawn. Recently, however, my interest was revived. A friend here has found that rice husk is very good for conditioning the soil so he digs in about 10cm of rice husk for his vegetable plot. Last year he got an unexpected bonus – a wonderful crop of mushrooms, more than he and his friends could eat for a month or two.

The local Idoma people know of the mushrooms and call them *Ifu Ap'Ochi Kapa* – meaning *mushrooms of rice husks* – because they have long realised they spring up where rice is threshed in the fields and the husks and straw are left behind.



So, if you grow rice or live near a rice mill, maybe you too can encourage mushrooms without worrying about complicated procedures. Make sure that you first make a fence to keep out animals.

Father Vincent O'Brien
Ogobia
PO Box 13
Otukpo
Benue State
Nigeria

EDITOR

You may find that leaving a few mature mushrooms on the soil will help encourage growth as they will release spores into the soil.

Beeswax candles

I AM A PASTOR working in the region of the Fula peoples. The people produce a lot of honey and wax. We have tried making candles from beeswax but they did not come out right. Can anyone help with ideas for making candles and other uses for beeswax?

Pastor Augusto Gomes
Guinea Bissau

EDITOR

Responses to the Editor please, so we can share with other readers (and for translation into Portuguese for Pastor Gomes).

Moulds for ferro-cement tanks

GREETINGS from the Kingdom of Swaziland. I'd like to share a few comments on the ferro-cement tank in *Footsteps 30*. Since 1994 I have been involved with a tank-building programme with local churches and several hundred have been constructed, both in Swaziland and South Africa. We have a good teaching video available in Zulu.

We have found using a mould a great benefit. We use bent corrugated iron sheets and make the mould in four pieces which are then bolted together. Each quarter of the mould is reinforced on the inside with a triangular support of wood.

We use a pre-cast foundation into which we put the outlet pipe. A thin layer of old engine oil must be applied before use as otherwise the cement sticks to the mould. The only disadvantage of the mould is in transporting it from one home to another. We have used a pick-up truck but plan to use a donkey cart in the future. Each mould makes at least 40 tanks.

Through experience we have learnt that nearly every concrete tank will leak. We use two layers of bitumen-based paint (non toxic) on the inside of every tank to prevent leaks.

Any responses are most welcome.

Willem Klaassen
Rural Ministries Ummotfo Farmers
Association
PO Box 387
Veni
Swaziland

African towns

UNFORTUNATELY there are many street children in Africa. In my country, Mali, they are most often cleaning shoes, selling things to passers-by and drivers or acting as guides to their blind parents. Society blames them and regards them as the lowest of the low. The town should reserve a special place for them, offer them playing areas and a supportive education system where they are valued and helped to develop their role in society. In short they should have places where they can find their dreams like other children of their age.

Our magazine, *Villes d'Afrique (African Towns)* began with the realisation that there is little thought about towns in Africa. In spite of all the inefficiency and lack of energy, we do believe in the dynamic which is at work everywhere in Africa. We want to contribute to the work of collective thought about towns. We hope to make a network of different abilities of all those living in African towns. So get your pens and write if you want to be part of this network!

Mr L Y Hassiniyou
Editor – *Villes D'Afrique*
5 Avenue Rose Delaunay
92330 Sceaux
France

EDITOR

Villes d'Afrique is only available in French.

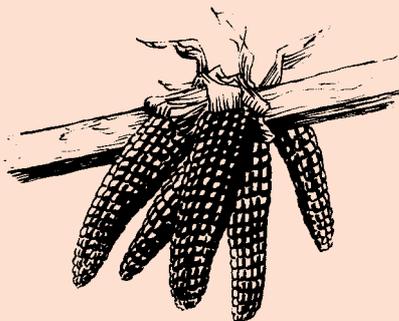
Grain storage

30% OF FRUIT AND VEGETABLES are wasted due to the unavailability of proper processing and preserving. Here are some practical ideas from different sources.

Is the seed dry enough?

Grains to be stored must be completely dry. Farmers can check this by biting on the grains. A very sharp cracking sound between the teeth is a sign that the seed is dry enough to be stored. Make sure watertight containers are used for storage.

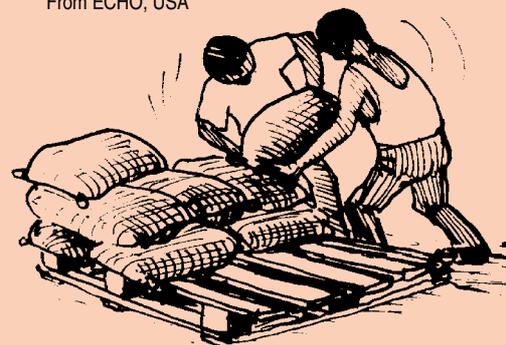
One way of ensuring grains keep dry is simply to hang maize cobs in the roof above the cooking fire.



Turning sacks

Some pests of bean crops such as weevil larvae need to wedge themselves into positions from which they can bore holes with their mouths into stored grains. The extremely simple measure of turning sacks upside down every morning and evening for several weeks can reduce pest damage significantly. As the sack is turned, so the larva loses its position and has to begin again. After several days without success most weevils either starve or are crushed.

From ECHO, USA

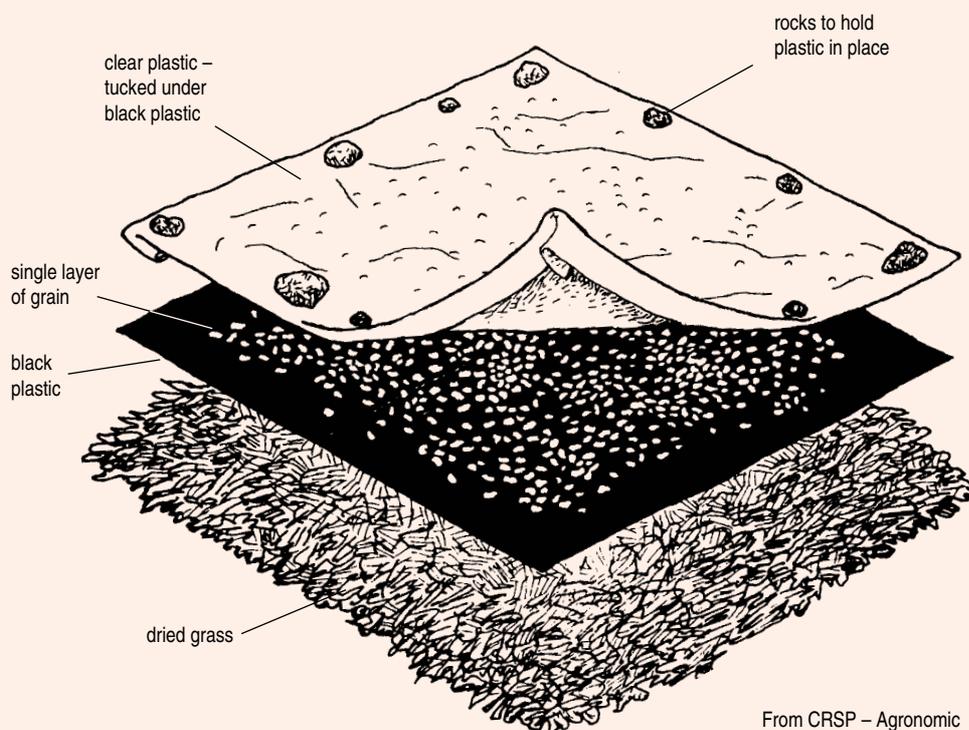


Solar driers

High temperatures will kill weevils – and their eggs, larvae and pupae. CRSP have designed a simple solar heater in which the temperature of grain will be so high that all pests will be destroyed.

Place a sheet of black plastic on top of an insulating mattress of dried grass. Cowpeas, beans or grains are placed on this in a single layer. Then a layer of clear plastic is placed over the grains. The clear plastic and black plastic are folded together and tucked underneath using small stones to hold them in place.

Treat the beans and grains as soon as possible after threshing. Use the heater when the weather is clear and sunny. Treat seeds for at least 2 hours around midday. Then store the grains (using one of the improved methods shown opposite). The solar heater is ready to treat more grains the next day.

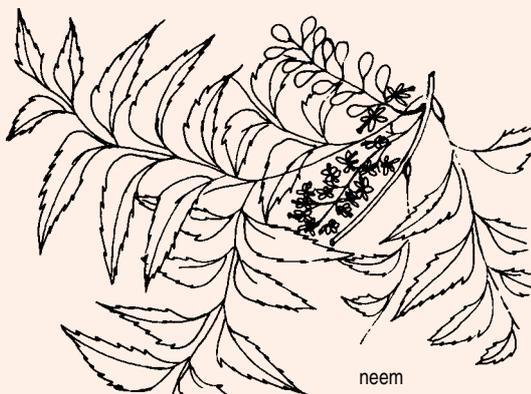


From CRSP – Agronomic Research Institute of Cameroon, Maroua Research Centre, Cameroon

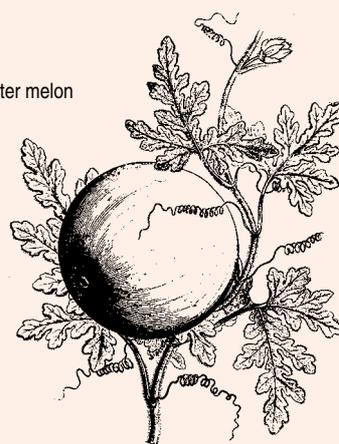
Protective plants

Many local plants can be used to protect harvested crops from insect pests. Ask elders what plants have been traditionally used. A great many plants may help to protect stored grains from insect attack.

For example, **neem leaves** (*Azadirachta indica*) and leaves from the **cassia vine** (*Cassia nigricans*) can be dried completely and either used whole or powdered and mixed with cereal and bean seeds. Neem leaf powder can be mixed with water and clay to make a sticky plaster. Spread this over the inside walls of pots, baskets and granaries used to store grain.



wild water melon



Another useful species is the **wild water melon** or bitter apple, *Citrullus colocynthis*, which is closely related to water melon. This is found in many countries in Africa, the Middle East and Asia.

The strong chemical, colocynth, is found in the fruit pulp of the fully grown but unripe fruits. Dried pulp could be mixed with water and clay and used as plaster. Dried and powdered fruit pulp could also be mixed into stored grain. In Egypt, crushed dried fruit are mixed with ashes, lime and dried chillies and stored with wheat and rice. In Egypt they also dry the gourds, make small holes and place them with clothes to protect them from insect damage.

Local names include *handal* (Egypt), *tumba* or *gartoomba* (India), *gareb*, *unun* (Somalia), *ekir* (Kenya) and *tagalate* (Niger).

Freshly harvested **ginger roots** can be dried and powdered and mixed with beans and grains. **Cashew nuts** also have protective value. Drill three holes into each nut to release the liquid and mix well with grains.

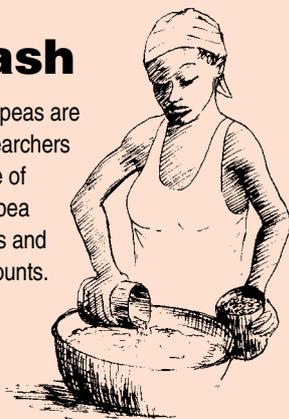
With thanks to SEPASAL for much of the above information. SEPASAL, Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3AE, UK.

Storage of cowpeas in ash

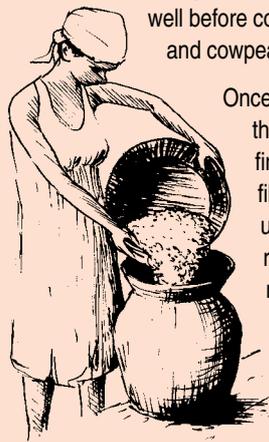
In areas of northern Cameroon, cowpeas are traditionally stored in ash. Now, researchers at IRA Agronomic Research Institute of Cameroon have confirmed that cowpea weevils cannot reproduce if cowpeas and ash are mixed together in equal amounts.

They recommend the use of a large clay water jar. All kinds of wood ash are effective. They should be sifted to remove large lumps of charcoal. One cup of wood ash and

one cup of cowpeas are added to a bowl and mixed well before continuing to add equal amounts of ash and cowpeas.



Once the bowl is full, they are poured in to the clay jar and pressed down very firmly to remove air. When the jar is filled, a 3cm layer of ash should be used to cover the top. This needs to be replaced each time cowpeas are removed. Make sure you wash the cowpeas before you cook them!



From CRSP – Agronomic Research Institute of Cameroon, Maroua Research Centre, Cameroon

Using vegetable oils

Research work at CIAT in Colombia now confirms a long established Indian tradition. Coating dry beans with vegetable oil is very effective in controlling bruchid beetles. The oil seems to interfere with the breathing of the insects. All kinds of vegetable oils are effective, but unrefined cooking oils such as palm oil are not only cheaper but also take longer to become rancid. **Use only edible vegetable oils.**



Beans treated in this way will still germinate well if used as seed.

In Mali, both cereal and legumes are treated with oil or melted butter. A second treatment after 12 days gets rid of any eggs which have survived the first treatment. Sheabutter is very popular.



Food storage and preservation



Photo: Mike Webb, Tear Fund

Buy fruit and vegetables when prices are cheap and then dry them.

THERE ARE MANY different blocks which may prevent the storing and preserving of food.

Selling food Farmers may sell much or all of the food they produce immediately because:

- They may need money urgently – for example, for school fees, taxes, repaying a loan, a marriage.
- They do not have good stores and know they will lose much of the food if they store it.

After harvest, however, food prices are usually low because many farmers sell at the same time. Later in the year prices usually rise.

Pests or moulds Much food may be lost or spoiled during storage by moulds or by insects, rats and mice because:

- The methods of storage are poor.
- Foods are not well dried before storage.

Lack of equipment or knowledge Much food may be lost because families either do not have the right equipment for preserving foods or because they do not know the best methods of preserving them – especially for newer crops, which may have no tradition of preservation in their culture.

Making improvements

There are several ways of helping people, including:

- Showing families how to handle harvested food and improve food stores and storage methods. It is especially important to make sure that people dry cereals, roots and legumes properly and that they use any chemicals safely.

An improved granary design

Simple improvements to traditional granaries may reduce the loss of grains to pests and diseases without requiring financial outlay. A workshop was held in Mundri, Sudan to look at grain storage. Relevant teaching was first given about the main enemies of stored grain – mould, insects, rats and mice and the four main environmental factors affecting their

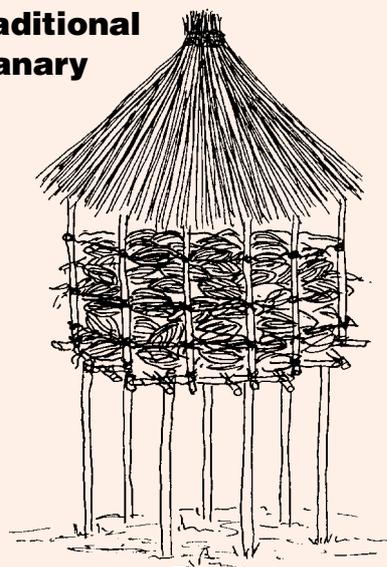
multiplication – heat, moisture, air and dirt. New ideas and designs were then introduced and discussed. Finally, however, the participants made their own decisions about an improved design for them.

efficient in reducing the amount of grain destroyed by rodents and insects.

Roger Sharland

First used in ILEIA Newsletter Vol 9 No 3

Traditional granary

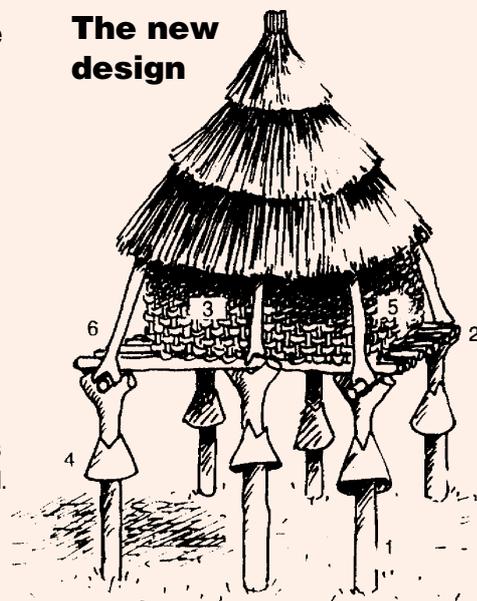


Features

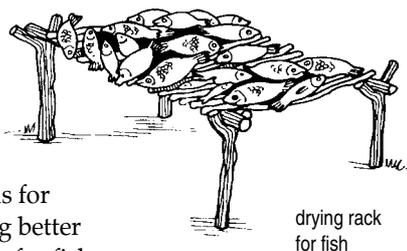
- 1 The new design has fewer legs – only 6 or 4.
- 2 The platform was raised to over 1m from the ground to prevent rats and mice jumping up.
- 3 Supports for the basket rise from the raised platform – not the ground.
- 4 Rat guards (made from old tin cans) are put on the legs at knee height or above.
- 5 The inside of the basket is coated smoothly with anthill mud and slime from a vine (*Cissus integrifolia*). Traditionally, buffalo dung was used but this is now in short supply and very difficult to get.
- 6 The roof is attached to the basket with poles reaching the platform rather than the ground.

Combining traditional skills and materials with the opportunity to discuss new ideas, resulted in a design which proved both practical and

The new design



- Developing, improving or encouraging simple methods for preserving foods – such as drying vegetables or souring milk or porridge.
- Demonstrating better methods for preserving fish and promoting better transport and storage facilities for fish.

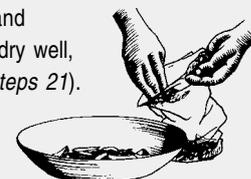


drying rack for fish

Information adapted from *Nutrition for Developing Countries* by Felicity Savage King and Ann Burgess (see page 15).

Drying vegetables

When fruit and vegetables are in season, prices will be very low. In rural areas it makes sense to dry the extra produce and store it for later. In urban areas, buy extra quantities when prices are low and preserve them for later. To dry fruit and vegetables, cut into small pieces and dry well, preferably in a solar drier (see *Footsteps 21*). Keep in air-tight containers or plastic bags. Check regularly for mould.



Fermentation

by Dr Ann Ashworth

THE BENEFITS of fermentation have been recognised from the earliest times. There are records of fermented foods being used by the Sumerians, ancient Egyptians, Babylonians and Assyrians. Chinese descriptions of *miso* from soy sauce go back to 1000 BC. Other foods that are commonly fermented are milk (to make soured milks and yoghurt), cereals and cassava.

In Africa *ogi*, *uji*, *ting*, *koko*, *kenkey*, *obusera*, and *nasha* are common fermented porridges. Fermented dough can be made into bread, as in *injera* and *kocho* in Ethiopia. In Latin America, maize and cassava are fermented. Examples are *pozol*, *chicha* and *farinha*. In the Indian subcontinent, cereal and pulses are often fermented together to make *idli*, *dosa* and *dhokla*. In south-east and east Asia, most fermented foods are based on pulses and



fish. Many of these are used as flavourings, such as *miso*, *natto* and fish sauce. These products may be appreciated far from their country of origin.

There are two kinds of fermentation: **sour fermentation** which produces acid, and **alcohol fermentation**. In each case, special harmless micro-organisms are introduced into the food and allowed to remain and multiply. The micro-organisms bring about beneficial chemical changes in the food.

Benefits of fermentation

- The acid produced in sour fermentation helps to preserve the food. In fermented porridges, the main acids are lactic and acetic acids.

- In Tanzania, children given fermented porridge have less diarrhoea than children given unfermented porridge. Porridges are often contaminated with bacteria that cause diarrhoea because of impure water or poor hygiene. Fermentation helps to reduce contamination because these harmful bacteria cannot multiply as easily in fermented food.

- Fermentation improves the absorption of important nutrients, particularly iron and zinc.

- Fermentation improves the protein content and adds vitamins and minerals.

- Many people prefer the flavour of fermented food. It has been suggested that the sour taste helps to restore appetite when people are ill.

- Fermentation reduces the toxin (cyanide) that is naturally present in cassava, particularly in the bitter varieties. The traditional way of making *gari* and *farinha* by grating cassava and then letting it soak in water to ferment, cleverly allows the acid to release the toxin. The benefit of this practice was appreciated by our ancestors, although the 'science' of it has been known only recently.

Fermentation is a good example of traditional wisdom! Unfortunately its use is in danger of declining in favour of western products. In Kenya the decline in some areas has been attributed to missionaries discouraging the preparation of sour porridges in the mistaken belief that they contain alcohol. Also, health workers tend to stress the need to prepare fresh food and so discourage the use of fermented foods. Encourage people to value their traditional fermented foods.

Dr Ashworth works at the Centre for Human Nutrition, London School of Hygiene and Tropical Medicine, 2 Taunton Street, London, WC1H 2BT, UK.

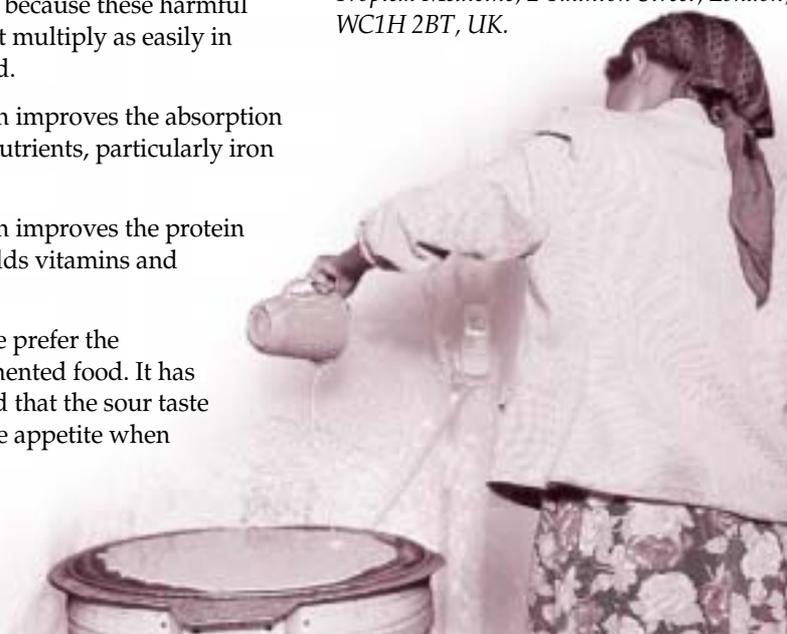


Photo: Richard Hanson, Tear Fund

Preparing injera in Ethiopia.

C O P I N G W I T H

DROUGHT

by Pukuta N Mwanza

Photo: Richard Hanson, Tear Fund

LUANGWA AND GWEMBE are two regions of Zambia which have been severely affected by five years of continuous drought. These droughts have left farmers poorer than before because they have been forced to sell their assets – livestock, equipment – and use up their savings to survive.

Recently EFZ (Evangelical Fellowship of Zambia) has organised village workshops on the subject of 'Drought Mitigation'. In Gwembe 100 people from 55 different villages were invited for a four day workshop. The response was overwhelming and people came long distances. One young man, for example, arrived exhausted after walking over 20km.

The participation and enthusiasm of villagers was very encouraging. Bible studies, quizzes, teaching and demonstrations on oil extraction were included in the programme. Most time was spent in mixed group work and women felt free to participate fully. Points raised were then shared with all participants in open sessions. Issues of food security, food shortages and disaster mitigation were discussed and the following points emerged:

GENERAL OBSERVATIONS

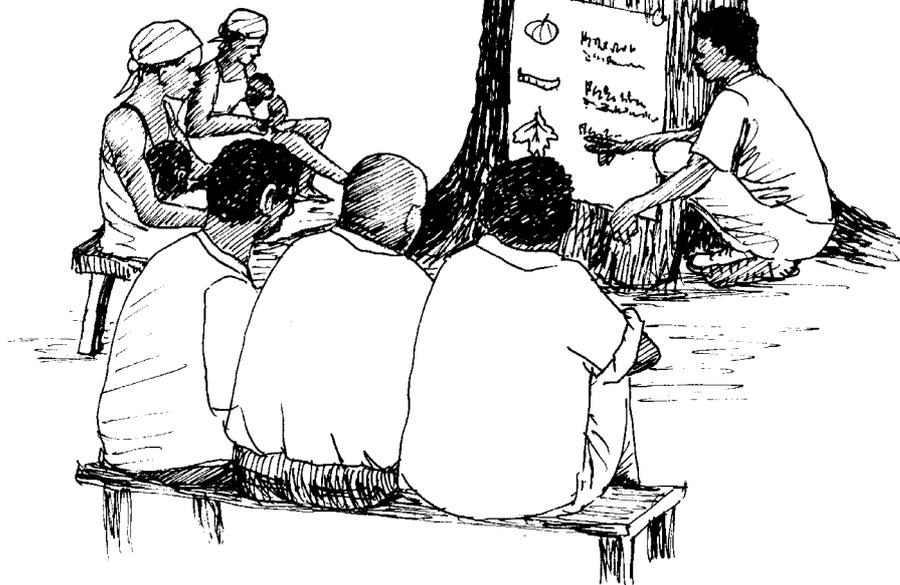
- There is little arable land available to cultivate because much of the land is hilly and rocky.
- People who come from outside areas are regarded as 'foreigners' and given very small plots of land.
- Parents have to divide their land to give to their children when they marry

and this reduces the size of household farmlands.

- Many families do not use animal power for farming which limits the amount of land a single family can cultivate with hoes.

EARLY WARNING SIGNS

- Rapid increases in market food prices
- Sale of animals suddenly increases
- Households move from self-sufficiency to buying foods.



TRADITIONAL DROUGHT-WARNING BELIEFS

- Large movement of birds
- Large harvest of wild fruits before the rains begin
- A lot of honey in the bush
- A belief that many baby boys are born just before the rains. (People were very divided on this belief.)

TRADITIONAL PRESERVATION METHODS

- Use of cow dung as a repellent for insects and weevils
- Storing maize in grain stores built above the fire place so the heat and smoke drive away rats, weevils and insects.

WAYS OF COPING WITH DROUGHT

- Participants compiled a list of 50 different wild tubers and fruits available at different times throughout the year. We were amazed at how God has helped to provide these numerous fruits and tubers which people can rely on in times of drought. People felt strongly that they needed to learn more about how to preserve and store these different foods to extend their usefulness.
- People raise money by making baskets, fishing, hunting, gardening on the banks of the Zambesi river and selling their domestic assets.

Results

Participants were asked to share all that they had learnt on their return home. Certificates of attendance were presented to all, and this gave the participants a real sense of achievement. Some could not hide their great joy as they sang and danced on their way home.

A month later we visited the area and found some participants had done a great work in training their fellow villagers. Many villagers were eager to share what they had learned with us. In Chipepo area Arthur Ngandu, one of the participants, was found busy teaching on drought mitigation and preparedness. When the EFZ truck got stuck in the mud during seed distribution, villagers would not interrupt their class because 'we are listening to something serious!' The driver was puzzled but happy with the commitment and dedication of the villagers towards the drought mitigation programme.

Pukuta Mwanza is the Coordinator of the Ethics, Society and Development Dept of the Evangelical Fellowship of Zambia.

How to make jam...

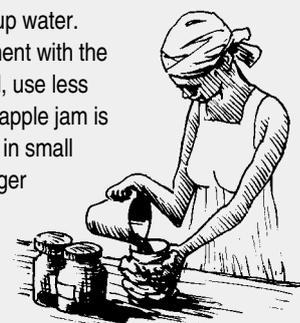
ALL KINDS OF SOFT FRUIT can be used to make jam. If possible, use a book of jam recipes which will tell you exactly how much fruit, sugar and water to use for each different fruit. However, if you cannot find such recipes, here are the general principles of jam making.

Use ripe soft fruit, chopped into small pieces – for example, mango, cape gooseberries, raspberries, strawberries and guava all make good jam. Measure out the fruit in cups as you place it in a large pan to cook. Jam will bubble up a great deal as it cooks, so make sure you don't use too small a pan.

For every 2 cups of fruit use just a $\frac{1}{4}$ cup of water (less if the fruit is very juicy like pineapple, raspberries or strawberries). Cook the fruit until very soft (usually 15–20 minutes). Then add 1 cup of sugar for every 2 cups of fruit. Stir well and allow to boil for 15–20 minutes until it will set. Test for setting by dropping a small amount of jam onto a cool plate. After a few minutes, push it with your finger. If it wrinkles and forms a skin it is ready. If it does not, boil longer and try again. You may need to add more sugar.

Take very clean, dry jam jars. Before pouring the jam in each, wrap well with a cool, damp cloth to prevent the glass breaking. Fill and cover with a clean lid.

Remember the proportions – 2 cups of fruit : 1 cup of sugar : $\frac{1}{4}$ cup water. Remember too that this is just an approximate estimate. Experiment with the fruit you have. Soft fruit needs little cooking. If it does not set well, use less water and more sugar. If it sets like a rock, use more water. Pineapple jam is very hard to set and does not keep well (but tastes good!) Make in small quantities. Oranges, lemons and other citrus fruit need much longer cooking and for every 2 cups of fruit add $\frac{1}{2}$ cup water and $1\frac{1}{2}$ cups of sugar. Tie the citrus seeds into a piece of cotton and cook with the jam to improve setting.



BIBLE STUDY

Enough is as good as a feast

by Stan Crees

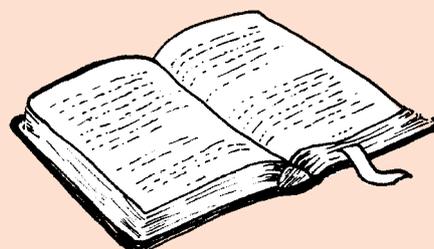
GOD'S WORD has much to teach us about food, its provision, storage, benefits and our responsibility to share it. Read Psalm 65. This provides a clear example of God's generous nature. Here God is seen to bless the land with showers so that crops grow abundantly, providing more than is needed. There are similar passages in Psalms 68, 104 and 107.

Joseph (Genesis 41) wisely stored food for anticipated years of famine. The writer of Ecclesiastes mentions five times the enjoyment of eating as a gift from God. God is seen to be directly involved in providing food when he fed the Israelites in the desert with quail and manna. Read Exodus 16.

Today this same gracious God continues to provide for our needs. The fact that we grow food or earn money to buy it, can allow us to forget God's involvement. Worse still is the fact that we may be tempt-

ed to store up and accumulate too much food. Our self-sufficiency may lead us to exclude God and the needy around us. As the Israelite story unfolds (Deuteronomy 6 and 8) Moses warns the people with the words, 'When you eat and are satisfied, be careful not to forget the Lord your God.' In the parable of the rich fool (Luke 12) Jesus extends a warning against the accumulation of wealth without concern to help others.

It is good that this issue of *Footsteps* is concerned with food security and the need to plan ahead. This activity, certainly in areas of our world where food supply is limited and erratic, is a matter of good stewardship. But as we follow its advice we must remember the warnings in God's word (Matthew 25). Out of love for him we must make sure our needy neighbours have that quality of life which enables them also to give thanks to God.



For discussion:

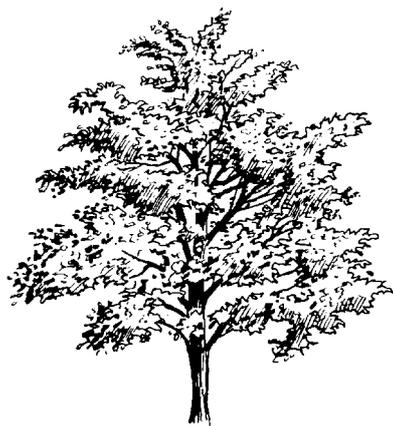
- From Exodus chapter 16 discuss the significance of Israel's manna becoming full of maggots and stinking if it was stored. How should this affect our attitude to storing food we do not need?
- How does your faith in God affect your relationship with Christians world-wide who do not have enough to eat?
- Read 2 Corinthians 8:13-15. Consider the distribution of food in your own community and discuss ways of improving the situation.

Pray that God will give us greater compassion for those who barely survive from day to day in our global community.

Stan Crees is Liaison Officer of Operation Agri with the Baptist Missionary Society, 45 Grosvenor Road, Wallington, Surrey, SM6 0EN, UK.

Henry Doubleday Research Association Tree Selection and Advisory Service

This group provides information, advice and – where available – tree and shrub seeds to NGOs, self-help groups, farmers, schools and other organisations involved in forestry and agroforestry in developing countries.



Applicants are sent a form asking for details of climate, the use for which trees are to be grown and details of the project. Applicants may also ask for more information about particular species. Requests for further information should be sent to:

*International Advisory Officer
Information and Education Department
HDRA
Ryton on Dunsmore
Coventry
CV8 3LG
UK*

Fax ++1203 639229

E-mail: enquiry@hdra.demon.co.uk

Seeds of Survival

This programme began in Ethiopia in 1988. It works with farmers and scientists to preserve and encourage the use of traditional varieties of crops which produce harvests without needing expensive chemical inputs (see page 16). This also means that many different varieties are available for breeding new varieties in the future. A newsletter is available called *African Diversity*. Write for information to:

*Seeds of Survival
PO Box 5760
Addis Ababa
Ethiopia*

International Conference on Ethnoveterinary Medicine: Alternatives for Livestock Development

Ethnoveterinary medicine includes the use of medicinal plants, surgical techniques and management practices to prevent and treat livestock diseases. An international conference on traditional animal healthcare and management will be held in Pune, India on 4–6 November 1997. Interested participants are invited to send papers, organise special 1½ hour workshops and develop exhibits for a resource and information sharing event.

For further information please contact:

*Dr D Rangnekar
BAIF
PB 2030
Asarwa Road
Ahmedabad 380 016
Gujurat State
India*

Fax ++91 79 212 3045

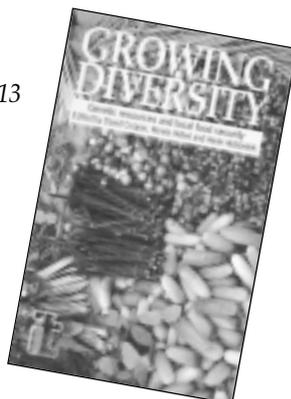
Growing Diversity

There is a growing recognition of the vital importance of plant genetic resources for world food security. New varieties bred in research stations around the world are fast replacing traditional varieties and reducing genetic diversity. This book looks at the crucial role of small-scale farmers in developing sustainable approaches to agriculture and in preserving traditional varieties. (The article on page 16 is adapted from this book.)

The book costs £13.15, including surface post and package, and is available from:

*IT Bookshop
103–105 Southampton Row
London
WC1B 4HH
UK*

*Fax:
++ 171 436 2013*



Small Scale Vegetable Oil Extraction

This book gathers together useful information about the various kinds of machines which extract vegetable oil. It covers small, hand-operated machines to large-scale, industrial-size machinery.

The first part looks at the chemical differences of various oils and provides information on marketing. Later chapters cover the different processes in extracting oil and details on the different oilseeds. There is a comprehensive list of suppliers and addresses.

Single copies are available free of charge to educational groups, research institutions and non-profit-making organisations in countries receiving British Aid. Write, using your official title, to:

*NRI
Central Avenue
Chatham Maritime
Kent
ME4 4TB
UK*



Cover Crops: a review and database for field users

There is growing interest in cover crops in a number of situations. They have a wide range of uses from improving and protecting soil structure and fertility, soil and water conservation and weed suppression.

This 180 page review provides extensive details of over 80 species. The database comes with a computer disc. This review would be a very useful reference source for those working with cover crops. It is not aimed at a general audience. Copies are available free of charge from NRI (address above).

Group training booklets

Agrimissio (of the International Catholic Rural Association) have produced a very helpful series for group promoters. There are now five in the series. Simply produced, with plenty of practical ideas and exercises, they would be of great help to anyone involved in leading a

group. They are available free of charge in either French or English.

Write, explaining your work, to:

ICRA-AGRIMISSIO
Palazzo San Calisto
00120 Vatican City
Rome
Italy



Health Promotion in Our Schools

The Child to Child Trust has been encouraging health action in schools with children actively participating in promoting health improvements. This book seeks to give ideas to all who want to make schools healthier. The ideas in the book can be used at different age levels. It contains information on how to use health facts, improving health beyond the classroom, evaluating health improvements and deciding on priorities. This book contains practical information of use to any school, however limited their resources, on improving children's health.

It costs £2.75 (including postage and packing) from:

TALC
PO Box 49
St Albans
AL1 5TX
UK



Nutrition for Developing Countries

by Felicity Savage King and Ann Burgess
Second edition 1992 ELBS edition

This revised edition provides 500 pages packed with practical information, illustrations, ideas for discussion and role plays about every aspect of nutrition. It includes information on all the various food groups and micro-nutrients, food processing, food storage, meal preparation, breastfeeding, weaning, childcare, growth charts, various kinds of malnutrition and deficiencies, working with communities, families and schools.

All this for the price of £10.00 including postage. Available from TALC at the address above.

Animal Husbandry Books

The Christian Veterinary Mission publish a number of useful books on animal care. They have a series of seven books each with a title beginning *Raising Healthy...*: *Pigs, Goats, Rabbits, Dairy Cattle, Poultry, Beef Cattle* and *Fish*. All are available in English. *Raising Healthy Poultry* is also available in Spanish.

They will send a free set to Christian mission agencies and agricultural libraries in developing countries. (If possible, they do appreciate a donation of US \$6 for each book). Individuals in developing countries can buy copies for US \$6. Orders from other countries are charged US \$10. Order from:

Christian Veterinary Mission
Box 33000
Seattle
WA 98133
USA

Fax ++ 206-546-7269

E-mail: ald@crista.org or missionvet@aol.com

A Guide to Spanish Language Sustainable Agriculture Publications

by Beatriz Cabezón

This guide contains summaries of 74 Spanish publications on sustainable agriculture, with details of their content, level, price and ordering information. It also contains some useful addresses of advisory groups and libraries. It costs \$10 and can be ordered from:

UC Sustainable Agriculture Research and Education Program
University of California
Davis
CA 95616
USA

Sembradores de Esperanza: Conservar para Cultivar Y Vivir

by Monika Hesse-Rodríguez

This is a well-illustrated book with many clear photos, which looks at practical ideas for soil conservation. Changes in agricultural practice may be very slow. Farmers may also select very different approaches to tackling soil conservation.

For this reason the author gives many alternative ideas, such as: A-frames, various kinds of terraces, agroforestry, living fences and windbreaks. Discussion questions and case studies form an important part. The book will be useful to community leaders and extension agents.

The book costs only US \$4 and can be ordered from:

Senor Juan Bautista Mejia
Servicio de Publicaciones del Obispado de Choluteca
Apdo 40
Choluteca
Honduras
Central America

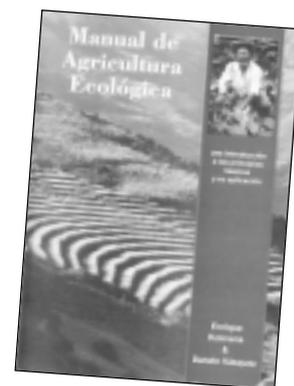
Manual de Agricultura Ecológica

by Enrique Kolmans and Darwin Vásquez

This 220 page Spanish book is well-illustrated and provides an introduction to the basic principles of ecological agriculture. It looks at soil composition, root growth, methods of cultivation (including zero cultivation), managing weeds, pests and diseases organically, agroforestry, trade and balanced ecosystems. The book is available from SIMAS directly for US \$20 (plus postage).

SIMAS are also looking for distributors to sell the book for them at commission in Latin America. It is only available in Spanish. Order from:

SIMAS
Apdo A-136
Managua
Nicaragua
Central America



Join the Footsteps team!

We are looking for new people to help with the editorial committee four times a year. Volunteers need to have wide development experience and a real concern for making *Footsteps* as relevant as possible. You need to be at the end of a good, fast postal service from the UK and have access to fax or E-mail for easy communication. All help would be voluntary! Contact the Editor.

Promoting local conservation

by Miges Baumann

ANIBAL AND ORFELINA CORREO live in the village of Boliche in Simiatug, Ecuador. They tell their story of their use of new potato varieties developed at the National Institute for Agricultural Research...



Photo: Tear Fund

New methods

'The agronomists came and encouraged us to set up a co-operative. They brought us new varieties of potatoes and artificial fertiliser and started field tests. At first the new seed potatoes gave a much higher yield with different fertilisers. We believed these were much better than what we used before. But by the next year the yield began to fall. In the third year we had problems with worms. The agronomists brought in fungicides and pesticides to deal with the pests, but the chemicals got more expensive every year. We also had to increase the pesticide dose all the time. The potatoes began to taste bitter because we were spraying so much.'

Artificial fertiliser is very expensive. 'Six years ago we could buy a sack of artificial fertiliser for a sack of potatoes. Today the same sack of fertiliser costs six sacks of potatoes,' explains another farmer. Pesticides and new seed potatoes are expensive as well.

Discouraged, Anibal and Orfelina Correo went back to their traditional method of cultivation which had maintained stability for centuries. This meant returning to organic manure, skilful rotation of crops and to the traditional potato varieties. They were lucky to find them as the traditional varieties are often lost when new varieties replace them.

Old methods

Belisario also grows potatoes. But in his field near Atupulo on a 3,700 metre high plateau, he does not plant any of the new varieties recommended by agronomists and the government. He does not need

any of the artificial fertilisers or pesticides recommended by the government. Neither does he carry out the recommended mono-cropping of one variety. Instead, he plants his potatoes the way his ancestors did, using more than ten different types of potatoes. He knows each part of his land and each of the different characteristics of the potato varieties he plants. One is more resistant to fungus, another withstands a certain beetle, one copes better with drought while yet another tastes particularly good. In this way Belisario can deal safely with climate and pest problems.

Asked why he plants the old varieties, he answers...

'They taste better and cook much more quickly. Our traditional varieties also bring a better price on the local market because people know and like these varieties. In the towns though, people are only familiar with the new varieties.'

The disappearing potatoes

Nowadays the farmers who use these techniques are few. The original range of varieties has virtually disappeared. Even in the agricultural research stations in the Andes, researchers (who bred the new varieties) are shocked by the speed at which varieties are disappearing. Indian organisations in many places are becoming aware that the original varieties of potatoes are part of their traditional agriculture and cultural heritage which should be protected.

The Swissaid Coordination Office in Ecuador is now trying to encourage this approach. Sustainable agriculture and conserving genetic diversity are important principles of their development policy. In the face of massive propaganda from the chemical industry they create awareness of alternative approaches and encourage farmers' groups to have confidence in their traditional experiences so they can make realistic choices.

Miges Baumann works with Swissaid, Jubiläumstr 60, CH-3000 Bern 6, Switzerland raising awareness of local conservation for sustainable development. This article was adapted from the book Growing Diversity, edited by D Cooper, R Vellvé and H Hobbelink and published by Intermediate Technology. (See review on page 14.)

EDITOR:

The situation in Ecuador is being repeated world-wide as traditional varieties and sustainable agricultural practices are replaced with new commercial varieties (which often require fertiliser and pesticides to yield well) and mono culture. Sorghum, maize, rice, beans and many other crops could be used as similar examples. New varieties may often be of great benefit, but the total replacement of traditional varieties carries considerable risks for farmers in the long term.

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