

On-farm processing and storage of agricultural products help secure a year-round food supply for rural families. All efforts to grow crops are in vain if the yield is destroyed by mould, insects and other pests before it can be used. When production and storage is successful, surpluses become available for sale. Most smallholders, included so-called "subsistence farmers", sell part of their produce, at least in good years or when in need of non-farm products or services, such as medical care. The sale of processed or stored products can make an important contribution to their income and wellbeing.

After the Harvest



Photo: Barbara Bort

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Articles in this issue highlight some of the many functions of postharvest treatment of crop and animal products. The great diversity of processing techniques developed by rural people permits:

- the productive use of wastes (eg, crop residues);
- the use of foodcrops which require elaborate processing but have other advantages, such as a high yield per hectare or a good fit into the cropping pattern;
- long storage of farm products to provide a more balanced and diversified food supply and to bridge dry seasons;
- improvement in the nutritive value of farm products (eg, higher vitamin release);
- an increase in market value by refining products or by allowing them to be kept until prices are higher.

Throughout the world, women play a major role in postharvest activities at household and village level. Their hard work increases the value of harvested products. They are often the custodians of age-old secrets, as well as very capable innovators who modify and improve both old and introduced techniques, as shown by cases from Côte d'Ivoire, Sudan, Thailand and Bolivia.

What technology is appropriate?

Numerous projects have tried to develop "appropriate" postharvest technologies: introducing new raw materials or equipment and trying to make processes faster, easier and more profitable. Unfortunately, these well-meant efforts often met with little success, judged by the extent to which they have been adopted and have benefited smallholders. Criteria for selecting Appropriate Technology (AT) were

defined by outsiders, or the technical problems were considered in isolation, rather than in their socioeconomic and cultural context. Women were often bypassed in the attempts to improve old or introduce new technologies or products.

In mainstream research and development, many schemes still advocate the collection of raw materials from farms for centralised processing in highly-mechanised commercial factories, mills, dairy plants etc. As a rule, this means that the value added through processing is transferred to the large entrepreneurs.

Modern technologies and agrochemicals have likewise brought big changes in storage methods: large storehouses, new building materials and ways of regulating temperature. But these are often highly dependent on fossil fuels and imported equipment and expertise. Most small-scale farmers have not benefited from such large-scale changes, and certain technologies are now known to have negative side-effects. Buildup of mould and disease can be much greater in large stores of, say, corrugated iron and demand much heavier control measures than needed in many traditional stores. The fungicides and insecticides can cause health problems and change the taste of the stored products. Moreover, the traditional knowledge of using low-external-input techniques to cope with pests is eroded.

Reviving indigenous technology

Recently, somewhat more attention has been paid to the processing and storing of minor food crops, like sweet potatoes, which may play an important role in rural survival strategies. However, many localised crops, like enset (false banana) in southern Ethiopia, although a staple food in the area, are given little attention by researchers even in the country itself.

Likewise, the increasing interest in bio-

Processing agricultural products is often long and tiring work. These women in Côte d'Ivoire chose to try out a screw press to ease the work involved in making palm oil.

technology research runs the risk of devaluing indigenous crops and knowledge, and favouring large commercial firms. In his prize-winning article for the Rural People's Biotechnology contest - a summary of which is included in this Newsletter - Hamid Dirar suggests that most research has no interest in "poor man's food" and concentrates on innovations with large profit margins. The mainly local significance of many indigenous activities in biotechnology and other postharvest processes also contributes to their marginal position.

To counterbalance the weight commonly given to modern technology, many articles stress the value of indigenous postharvest technology and the role it still plays today. It is standard practice, when proposing a project to modernise storage, to refer to the high postharvest losses resulting from poor local storage methods (which do exist). But why not take a closer look at the successful ones, such as the granaries built by the Aten in Nigeria, in which cereal harvests can be stored for several years? Or the natural methods of protecting food and seed developed by farmers in Mali?

Indeed, there is now a growing interest in documenting these local technologies and drawing the attention of researchers, development workers and funding agencies to the merits of preserving and improving them.

Saving for hard times

A theme which keeps coming back in reports on local food processing and stor-

age is the vital role of these activities in helping people through hard times. The products of complicated fermentation techniques developed in, eg, Sudan and the Solomon Islands are valued as survival foods and provisions for long travels.

Women have developed ways of preserving even marginal raw materials such as animal urine, hooves and hides as emergency rations, but also as delicacies. Strenuous harvesting and processing techniques are applied to transform local plants, such as enset, into edible and nutritious food as well as a wide array of other useful products. These are prime examples of making optimal use of available resources. One can only marvel at the ingenuity in thus managing to secure family survival from limited resources during hard (or even normal) times.

Needs are changing

Changes in food habits and resource availability lead to changing needs. Eating habits of both urban and rural people have been influenced by outside market forces and convenience (eg, many people now eat more bread and noodles). Crops such as wheat, maize and rice have been strongly promoted as staple foods in many areas during colonial times and thereafter, also in the form of food aid. This has led to decreased production of indigenous cereals and other food crops.

Changes in resource availability have led to changes in landuse systems, eg, shortage of grazing land induced some Borana herders in Ethiopia to settle.

People adapt to changing conditions by finding new solutions: new crops, new storage or processing techniques, new activities. Borana women have started making hay to feed calves. Fulani herders in Burkina Faso are likewise storing hay as dry-season cattle feed. Farmers in Niger

have realised that their millet residues can be sold as fodder, now that grazing areas have become smaller.

Identifying needs is a crucial step in this process of adaptation. The articles dealing with response to change underline the importance of an integrated view of the situation, recognising the interlinked needs and problems of households. Usually there are competing demands on resources such as land, milk (calves vs people) or crop residues (soil fertility vs fodder). Sustainable development will occur only when the local people themselves set the priorities and have the opportunity to tackle what they see as their most urgent needs.

Finding markets

Successful efforts to process and store more farm products than needed by the family or to make new products will be in vain if they cannot be sold. However, finding a market is not always easy, especially not for people who have recently become entrepreneurs. The examples in this issue about marketing, eg, by the women's noodle-making group in Bolivia, the silk weavers' association in Thailand and the coconut-drying firm in Bangladesh, all show the need for good organisational structure and finding the right market niche. All three groups try to maintain strict quality control and explain to consumers why their products are special and worth the price.

Making improvements

Documenting indigenous technology in processing, storage and marketing of farm products reveals scope for improvement. Particularly the processing methods tend to be lengthy and arduous. They consume much of women's time and energy, and often require a lot of fuelwood.

Technical improvements can be made by local people on their own, but can be speeded up through fruitful cooperation with outsiders. Many farmers are modifying and improving their techniques and products, and even changing them completely, sometimes influenced or induced by outside changes. Examples are given of indigenous innovations as well as development processes resulting from

combined efforts between researchers, NGOs and villagers.

The success of a new technology depends greatly on the process through which it is developed. It is important to take into account what is already there (existing technology, raw materials, infrastructure) and what the users want. For example, researchers in the Philippines sought the users' views about improvements in growing and processing sweet potatoes. Likewise, the women in Côte d'Ivoire had a chance to express their criteria for a new palm oil press and to modify the press to suit their way of working.

Staying in control

What was particularly important to the women in Côte d'Ivoire was to retain control of the processing technique. Fearing that young men would take over their work and the economic gains if motorised presses were introduced, the women organised themselves and bought a screw press. Also, the women's group in Bolivia decided to keep their fate in their own hands. They formed a collective and sought ways to make noodles themselves, using local cereals. Similar motives of maintaining a viable and independent village economy lie behind the activities of the cassava bread-makers in Haiti.

Many technology-transfer projects have not succeeded because the benefits - the higher yields and profits - did not return to the people who traditionally do the processing and marketing. This was a major reason why schemes to modernise dairying in Nigeria did not succeed. These were boycotted by the Fulani woman who, in the past and still today, derive much greater financial and social benefits from processing and selling fermented milk products themselves than by taking fresh milk to commercial milk-collection centres (Waters-Bayer 1986).

But care should also be taken in illuminating local knowledge and innovations in food processing and marketing. There is a danger that these will be collected by outsiders and used for commercial purposes, without benefiting the people who originally developed them. Dirar argues that researchers should not take away knowledge from local people, but rather decide together with them about needs for improvements and assure that the local people will indeed benefit from them. This is an important aspect of the ethics of research into indigenous technology. The local people must stay in control!

Why not take a closer look at traditional granaries, like this one made of clay, straw and manure in Kajeland in central Nigeria, which provide good on-farm grain storage? The sorghum is dried on racks before being placed in the granary.

Reference

- Waters-Bayer A. 1986. Modernising milk production in Nigeria: who benefits? *Ceres* 9 (5): 34-39.

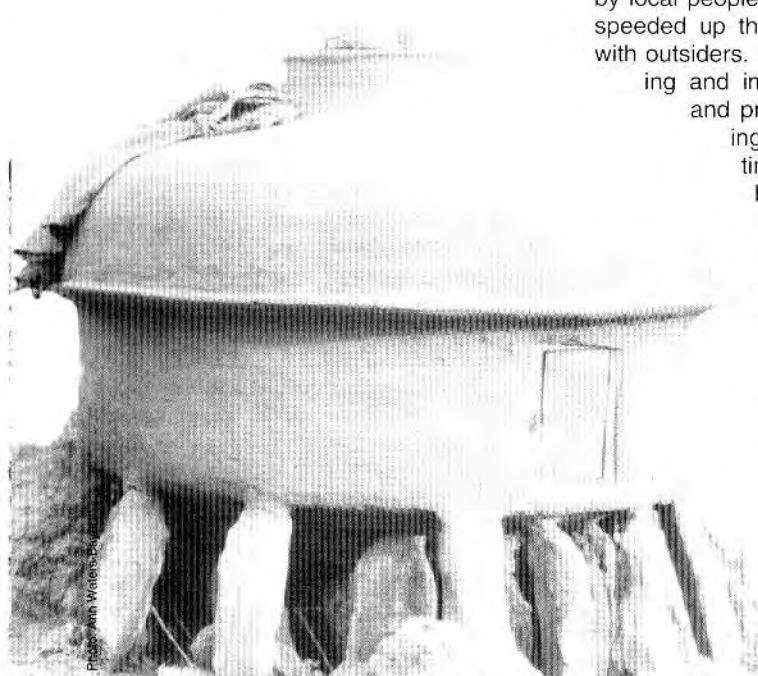


Photo: Ann Waters-Bayer