A guide to MARKETING COSTS and how to calculate them

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A guide to MARKETING COSTS and how to calculate them

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Foreword

The intention of this Guide is to explain basic concepts of agricultural marketing costs and marketing margins. It identifies the main types of marketing costs, provides brief advice on how to calculate them and discusses the interpretation of marketing margins.

An understanding of costs and margins is essential for all those involved with agricultural marketing. Farmers seeking to produce new crops need to be aware not only of their likely production costs but also of the costs of marketing these crops. Extension workers need to be able to advise farmers and farmers' groups on such matters. Wholesale and retail traders must, of course, be fully aware of their costs if they are to trade profitably. Finally, government officials concerned with monitoring the efficiency of agricultural markets need to have a full understanding of marketing costs and margins and need to be able to monitor these on a regular basis if they are to propose viable improvements, such as new markets.

In part, the aim of this Guide is to correct some of the widely held misunderstandings over marketing costs.

Traders' margins are often looked upon as being excessive; frequently this is because the observer lacks a full appreciation of all the costs involved.

This Guide should be particularly useful to marketing officers and extension workers who are called upon during their work to advise farmers on marketing and prices. It is hoped that it will be used by agricultural training colleges for their courses in agricultural marketing. The Guide can be used together with other guides in the FAO Marketing Extension Guide series.

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have to cover all the costs
that occur along the marketing chain

The marketing of agricultural crops involves the transfer of produce from farmer to consumer

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Farmer takes produce to local rural market

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FARM

LOCAL RURAL MARKET

2

Farmer takes produce to wholesale market

Produce is unloaded, weighed and delivered to wholesaler

Retailer purchases produce from wholesaler and takes it to his/her shop

Retailer sells produce to consumer

FARM

WHOLESALE MARKET

RETAIL MARKET

3

Farmer takes produce to assembly market

Buyer purchases produce at assembly market

Buyer takes produce to wholesale market and sells to wholesaler

Sub-wholesaler distributes produce to retail shops

Retailer sells produce to consumer

FARM

ASSEMBLY MARKET

WHOLESALE MARKET

RETAIL SHOP

The sequence of stages involved in transferring produce from the farm to the consumer is generally referred to as a marketing chain. Examples of marketing chains are shown on the opposite page.

The consumer could be as close to the producer as the same village or could be a consumer of cash crops living on the other side of the world. All transfers involve marketing activities in some form or other. All activities involve costs. At the simplest level the cost involved may just be the time taken by a farmer to walk to a nearby market and stay there until all his or her vegetables are sold. At the most complex level a product may be stored for lengthy periods, transported long distances and processed several times before reaching the form in which it is finally sold.

Why is the price of a product in a shop or retail market often so much higher than the price paid to the farmer? The costs involved with marketing are not always fully understood. We can understand that traders or processors spend money on transport or packaging or on fuel for a rice or maize mill but there are many other, less obvious, costs. Because these costs are not always visible, those doing the marketing are often accused of making unreasonable profits. People look at prices paid to farmers by traders and compare them with the prices consumers pay for the same product and assume that the farmers and consumers are being exploited. Sometimes, of course, traders do make very high profits but on other occasions they make small profits or even losses. Clearly, unless they make a reasonable profit traders will not want to take the risk of continuing in business, to the disadvantage of both consumers and farmers.

Generally, the more complex and lengthy the marketing chain the higher are the marketing costs. Thus simple comparison of farmer prices with retail prices is a poor indicator of marketing efficiency as it does not take into account the costs involved in moving produce along the marketing chain from farmer to consumer. If farmers live 20 km from a market they will normally receive a higher share of the final price than those who live 200 km away, because of lower transport costs. A producer of a perishable crop, such as tomatoes, is likely to receive a lower share of the final price than the producer of a non-perishable crop, such as coconuts, because some of his or her crop may be unsaleable by the time it reaches the market. A farmer who grows apples may receive a lower share of the retail price than one who produces pineapples, because apples can be stored for several months to take advantage of higher

prices later in the year, while pineapples cannot, but storage costs money. Similarly, an onion farmer may get less of the final retail price than a cauliflower farmer because onions can be stored for several months. Thus, in comparing farmer and consumer prices, we need to be fully aware of all the costs involved. Only then can we see if excessive profits are being made, if the marketing system is inefficient or if the high costs are justified.

This Guide briefly explains the concept of marketing costs and their calculation. Marketing margins are also discussed. The Guide will be particularly useful to marketing officers and extension workers who are called upon to advise farmers on marketing during the course of their work. Sometimes, for example, it may be in the interests of farmers to work together as a group to jointly market their produce. However, before this is done, someone, such as the extension officer, needs to be able to calculate the costs involved so that farmers can be sure they would be better off using a different marketing procedure.

Marketing practices vary so much around the world and according to the type of produce that this Guide can only identify possible costs and indicate ways of calculating them. In one country farmers may them-selves take their produce to the wholesale market; in

Produce being sold by the roadside ...

... roadside selling and buying is often the beginning of the marketing chain

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**Before the produce
is laid out for the consumer ...**

**... a great many things
may have happened
en route**

another, produce may be handled by two or three traders before it reaches the market. Differences in marketing methods even occur within countries. It is therefore impossible to provide a simple methodology for evaluating costs. For the same reason, it is clear that there is no such thing as a "reasonable" marketing cost for a crop, which extension workers could use to compare with costs in their area. The costs of marketing any one product depend on the circumstances in the country and in the area concerned.

Senior government officials who wish to go into more depth about cost calculation methods may like to refer to *Costs, Margins and Returns in Agricultural Marketing,* a publication which is available from FAO.*

The first chapter of this Guide briefly summarises the main costs associated with agricultural marketing and explains why they can vary so much. Subsequent chapters consider each individual type of cost (for example, packaging, handling, transport) in more detail. The Guide then discusses how to put together all of the individual costs in order to determine the total marketing costs involved in moving produce from the farmer to the consumer. A final chapter looks at marketing margins, how they are calculated and how to interpret them.

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1   What are marketing costs and why do they vary?

Getting produce to the consumer
involves numerous costs

Produce preparation and packaging costs

We assume that harvesting of produce and the movement of that produce to the farm gate or packing shed is part of the production cost. Thus the first marketing cost incurred is *produce preparation*. This includes cleaning, sorting and grading. The second cost that is usually faced by farmers and/or traders is *packaging.* Types of packaging used may range from a simple jute bag, which may account for less than one percent of the marketing cost, to sophisticated plastic packaging for direct shipment of fruits to consumers in supermarkets, which would account for much more.

Handling costs

At all stages in the marketing chain produce will have to be packed and unpacked, loaded and unloaded, put into store and taken out again. Each *individual handling cost* will not amount to much but the sum total of all such handling costs can be significant.

Transport costs

Once packed, produce is then *transported*. In many countries the initial transportation may be done by the farmers or their labourers, carrying the produce themselves or using animal-drawn carts. Alternatively, traders may send agents around to farmers to collect produce for assembly in one central area. As noted in the Introduction, costs will vary according to the distance between the farmer and market. But they will also depend on the quality of the roads. A farmer living close to a main highway will probably face much lower transport costs than one living at the end of a rough road, which causes much damage to trucks and is often impassable. Transport costs will be lower in countries where trucks and fuel are cheap than in countries where import duties are high. Truck owners have to buy their trucks; costs will be lower where bank interest charges are low than where they are high.

Sometimes *transport costs* are a simple matter to calculate because the farmer or trader pays a set price per kilogram to the transporter. But what do we do when produce is carried on a "per container" basis or when farmers or traders hire a complete truck and transport a variety of crops? How do we calculate traders' transport costs if they own their own vehicle?

Product losses

Losses are common with agricultural produce marketing. Even if nothing is actually thrown away products may lose weight in storage and transit. Thus one kilogram of a product sold at retail level cannot be compared with one kilogram sold by the farmer. Some-
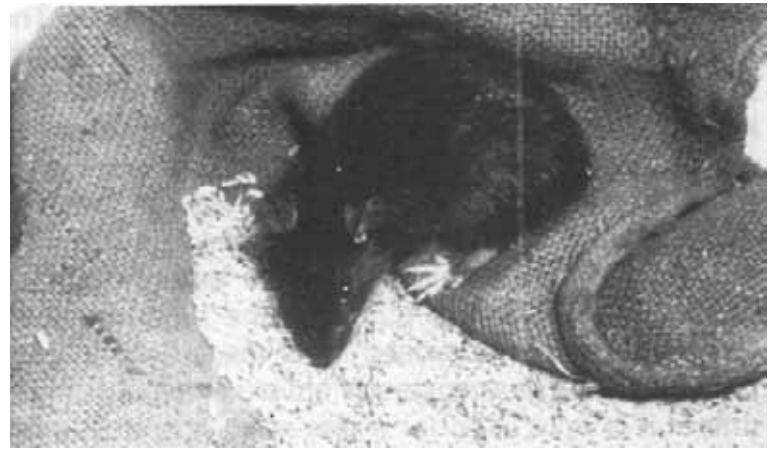
Using local materials for packing can be cost-efficient

Transport costs often make up the bulk of marketing costs

Produce is handled many times before it reaches the consumer

Product losses can be a considerable cost

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times very high losses can be recorded, particularly for a perishable fruits and vegetables. Losses will probably be highest in the main season when "gluts" of produce mean that much has to be thrown away unsold. In general, the longer the distance between farmer and consumer the higher the likely loss.

The treatment of losses in marketing cost calculations can be fairly complex. In particular, produce which is bought but not sold can still incur costs such as packaging, transport and storage. If there are no *quantity* losses there can still be *quality* losses and this is reflected in the price at which produce is sold.

Storage costs
Storage is an important cost for many products. The main purpose of storage is to extend the availability of produce over a longer period than if it were sold immediately after harvest. The assumption behind all commercial storage is that the price will rise sufficiently while the product is in store to cover the costs of storage. Such costs will vary, depending on the costs of building and operating the store but also on the cost of capital used to purchase the produce which is stored. If a store is used to its maximum capacity throughout the year costs will obviously be much less than if it is only used for a few months and is, even then, kept half empty.

Processing costs
Processing is often an important marketing cost. Grains such as rice and maize have to be milled. In working out total marketing costs we need to consider the conversion factor from unmilled to milled grain, as well as the value of any by-products. The price paid to the farmer for one kilogram of paddy cannot be directly compared with the price paid by the consumer for one kilogram of milled rice because they are not the same product. It is surprising how often something as simple as this is overlooked. Similarly, a coffee farmer can't compare directly the export price for a kilogram of green beans with the price he or she receives for cherries or even parchment coffee.

Processing costs can vary according to the efficiency of the organization doing the processing, the processing facility's throughput and the frequency of its operation. It will also vary according to the organization's costs which can depend on factors such as fuel costs, depreciation costs, import duties, taxes and wages.

Capital costs
Capital costs may not be very visible but are extremely important. To operate, traders may have to borrow money from the bank. The interest they pay on that money is a cost. If traders use their own money we cannot then say that they have no costs since they could

Storage extends product availability beyond the harvest – it can be expensive

Much processing takes place in villages

have left the money in the bank to earn interest instead of using it for trading. The cost of using their own funds is thus the interest they are not receiving. Economists call this an *opportunity* cost.

There are other opportunity costs. For example, traders could perhaps be using their time to do other work. For them to want to be involved with marketing the profit they make from marketing must be more than their alternative income opportunities. Often it must be significantly more, particularly when they run the risk of losing money.

Other costs

The costs considered above are the major costs that are faced in marketing agricultural produce. But there are many others and people involved with measuring costs need to keep all of them in mind. While they may be low in one country they may make up a sizeable proportion of costs in another. People using markets have to pay market fees. Often they will have to pay to have their produce weighed. Traders normally have to be licensed and pay license fees. In some markets wholesalers charge commission. Taxes have to be paid and, sometimes, bribes are needed, whether at road blocks when transporting produce or to get permission to operate a business. All these costs have to be built into the calculations.

An additional cost is that of obtaining information about market prices, market conditions and buyers. When farmers are deciding whether to grow new crops or to rear animals they will have to investigate how to sell those products. This may require costly visits to market towns in order to meet with potential buyers. It is useful for farmers to be able to monitor market prices. Where there are government market information services this can be done by radio; for poorer farmers both radios and their batteries can represent a significant cost. Richer farmers and traders increasingly use mobile phones to obtain market information; these also involve costs.

Prices and margins

Finally, costs have to be related to *prices* received. In a retail market in the morning tomatoes may be selling at a high price which appears to give the trader an excellent profit. By the evening, however, the trader may be selling them at a far lower price, knowing that the next day a supply of fresh tomatoes will be arriving. This must be kept in mind when comparing the selling price with the amount paid to the farmer. The price paid by the eventual consumer is thus made up of the amount of money paid to the farmer for his produce *plus all of the costs involved in getting it to the consumer in the form in which he or she purchases it and a reasonable return to those doing the marketing*

and processing for carrying out these functions. The percentage share of the final price which is taken up by the marketing function is known as the *marketing margin.*

Sometimes the marketing margin can be quite a high percentage and this may be used to argue that farmers or consumers are being exploited. However, high margins can often be fully justified by the costs involved. Without an understanding of those costs and how they are made up it is impossible to know whether margins are reasonable or not.

The final stage of marketing – selling to the consumer
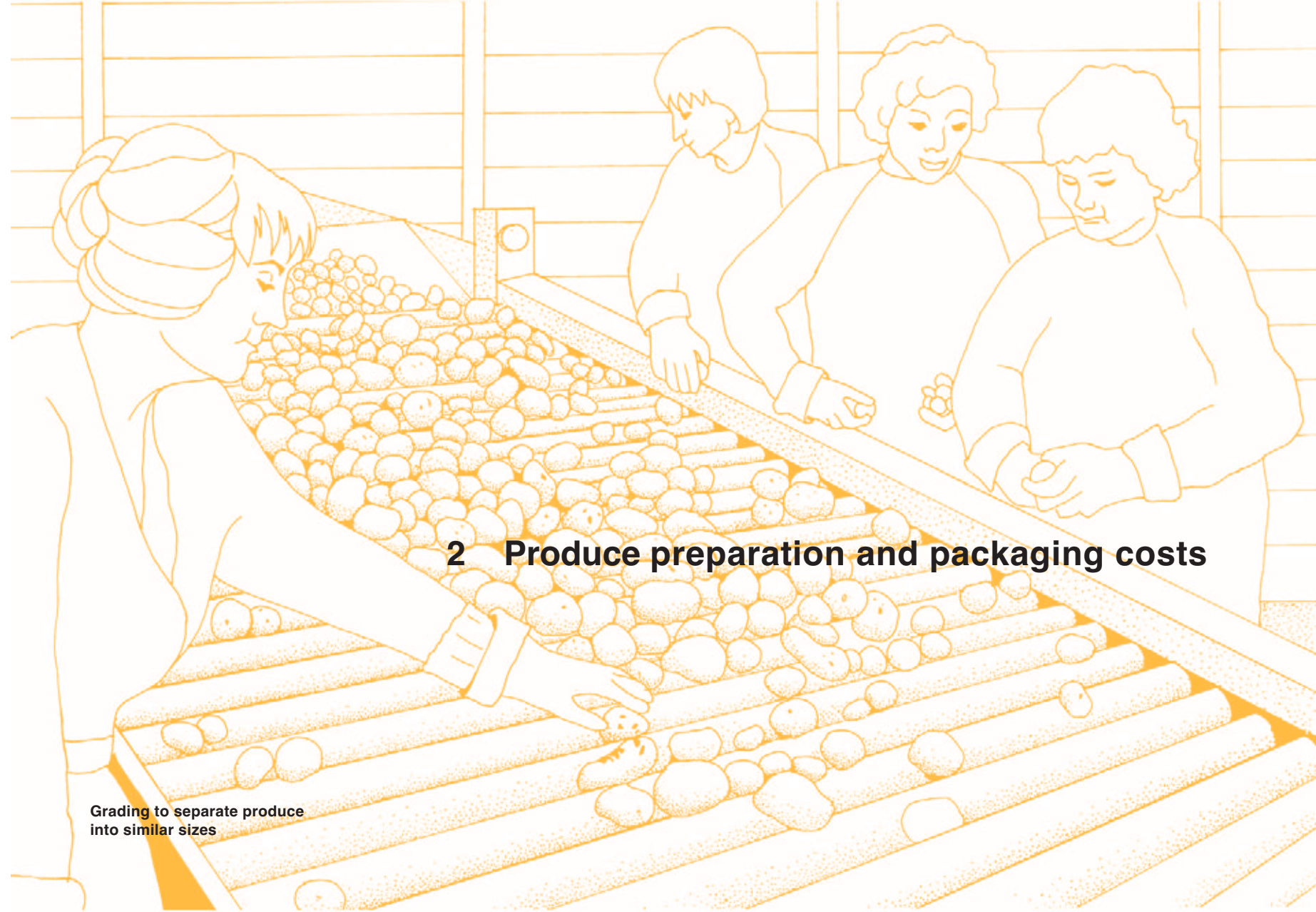
2   Produce preparation and packaging costs

Grading to separate produce into similar sizes

Produce preparation costs

Preparation of produce for the market can often be time consuming. However, money spent at an early stage on preparation and packaging should be more than repaid by higher prices and lower losses. Higher costs can be expected to result in higher returns. Preparation activities, sometimes undertaken by farmers but more frequently by traders, include:

- cleaning, such as removing soil and foreign matter;
- trimming, to remove unwanted leaves, stems or roots;
- sorting, to remove rejects and non-marketable produce (see Chapter 5);
- curing, for example as with onions, garlic or potatoes;
- grading, to separate produce into similar sizes and qualities before packaging, thus increasing the market value of the produce;
- waxing and wrapping, for example as with oranges in some countries, to preserve the produce and make it more attractive to the consumer.

Packaging costs

Most produce needs packaging. Exceptions are generally larger fruits and vegetables such as pumpkins and water melons which may be transported in bulk. Leafy vegetables, such as cabbages, are also often transported in bulk. Here the outer leaves themselves act as a form of packaging by protecting the inner leaves. There is no packaging cost but it should be

**Packaging serves
three basic purposes ...**

... handling and transport convenience ...

remembered that the outer leaves are often thrown away before sale and thus there is a cost in terms of product *loss.*

Packaging serves three basic purposes. Firstly, it provides a convenient way of handling and transporting produce. Costs would certainly be much higher if everything had to be carried and moved without any form of packaging. Secondly, it provides protection for the produce from damage during transit and handling.

The efforts which are continually being made to improve bulk packaging are designed mainly to improve the protection offered rather than to increase the convenience of the packaging from a handling point of view. Finally, packaging can be used to divide the produce into convenient units for retail sale and to make the produce more attractive to the consumer, thus increasing the price at which it can be sold. The more sophisticated the packaging, the greater the cost.

… product protection   ...

… marketing attractiveness

Quite often, the farmer will provide the packaging, such as jute or gunny sacks for maize and paddy, which is used right through the marketing chain. More complex and expensive packaging, such as plastic crates, will, on the other hand, normally be the trader's responsibility.

A fruit or vegetable may be packed and repacked several times on its way between producer and consumer, depending on the length of the marketing chain. The farmer may use one type of packaging (for example a sack) to take produce to market. At the market a trader may transfer the produce to a wooden box or plastic crate for transport to the wholesale market. Retailers buying at the wholesale market may then transfer the produce to their own packaging and then repack it (for example in plastic bags) for convenient sale. All of these various types of packaging involve costs, and need to be taken into account when working out total marketing costs.

The simplest packaging cost to calculate is when the bag, box, crate or basket is used only once. All you then need to know is how much produce the package contains in order to work out the packaging cost per kilogram. Often, however, things are not that simple.

With the use of more sophisticated bulk packaging, every effort is made to use the packages over and over again. In these circumstances you need to make an estimate of how many times the container is used to arrive at a cost per journey. Allowance must also be made for repairs and for the cost of transporting the empty package back to the beginning of the marketing chain. If a trader owns a vehicle and all his or her business is in one direction (that is from farms to town) then the cost of returning the containers is negligible. If, however, transport costs for the empty containers have to be paid this can increase packaging costs significantly. An example of this calculation is shown in Figure 1.

The type of packaging used in a particular country and for a particular marketing chain will depend on the costs and benefits of using it. Thus, plastic crates are likely to be used more for produce marketing in a country where they are manufactured than in a country where a 100 percent import duty is charged on such crates. Sophisticated packaging will be used more when it significantly reduce losses; non-perishable produce will not require expensive packaging because the benefits of using it will be marginal. The possibility of using improved packaging made with local materials should always be studied carefully.

Figure 1
Calculating packaging costs

Assume that oranges are packed **20 kg** at a time in wooden boxes which, with occasional repairs, can be used for **10 trips.** A box costs **$ 10,** repairs and cleaning during its life costs **$2** and each time the box is transported back empty to the producing area costs **$1.**

Then the packaging cost per trip is ...

[(original cost + repairs) ÷ number of trips] + transport when empty
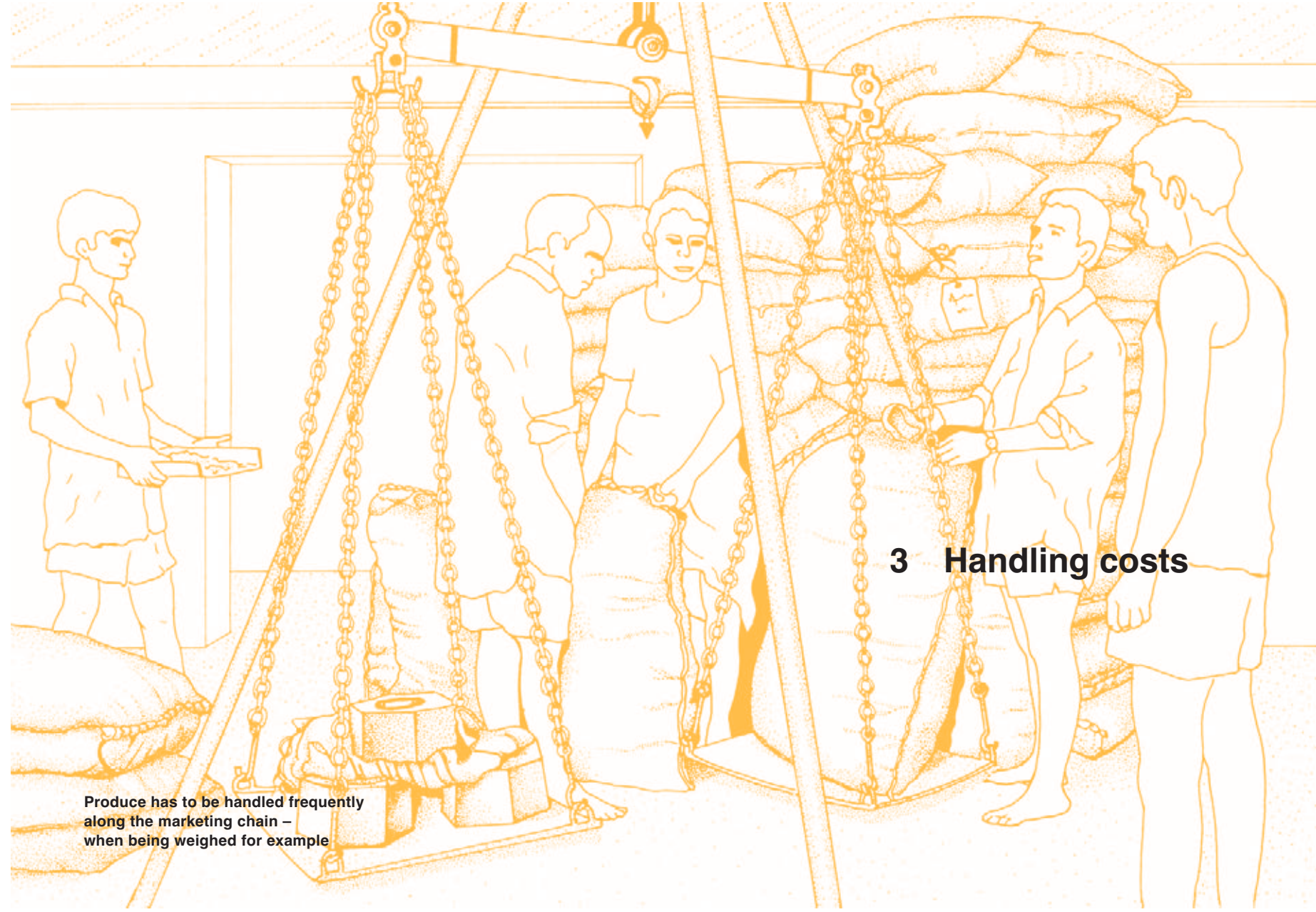or
($10 + $2) ÷ 10 trips + $1 = $2.20 per 20 kg
and
$2.20 ÷ **20 kg** = $ 0.11 per kg

3   Handling costs

Produce has to be handled frequently
along the marketing chain –
when being weighed for example

It is very easy to overlook handling costs. Each individual time a product is handled the cost per kilogram will be negligible. But a product can be handled many times before it reaches the consumer. The total of all these small handling costs can end up being quite considerable, particularly in countries with relatively high labour costs.

In some cases it is possible to get an accurate idea of handling costs. For example, porters at wholesale markets usually charge a fixed rate per box or per cart. In other cases, however, there will not be a fixed charge. Costs per container will then need to be worked out approximately by dividing the wage of the employee by the number of packages handled. Where casual employees are recruited on an hourly basis (for example at a market) this might be fairly easy. Where the person is a full-time employee of the trader the calculation is more difficult. The employee may spend many hours sitting on a truck travelling between the farmer and the market. He will be doing nothing during this time but the trader will still have to pay him if he want his assistance to load and unload.

Referring to a Farmer-Wholesaler-Retailer-Consumer marketing chain we could have the following individual handlings:

- farmer or labourer loads produce on to ox-cart;
- labourer unloads produce at assembly market and it is weighed;
- wholesaler or employee repackages the produce in wholesaler's containers;
- produce is carried to and loaded on wholesaler's truck;
- produce is unloaded at wholesale market and taken to premises occupied by wholesaler and weighed;
- produce is unpacked and sorted or graded;
- produce is repacked in retailer's containers;
- produce is carried to retailer's transport;
- produce is unloaded at retailer's store;
- produce is repackaged into plastic bags.

Farmer loads produce on to an ox-cart
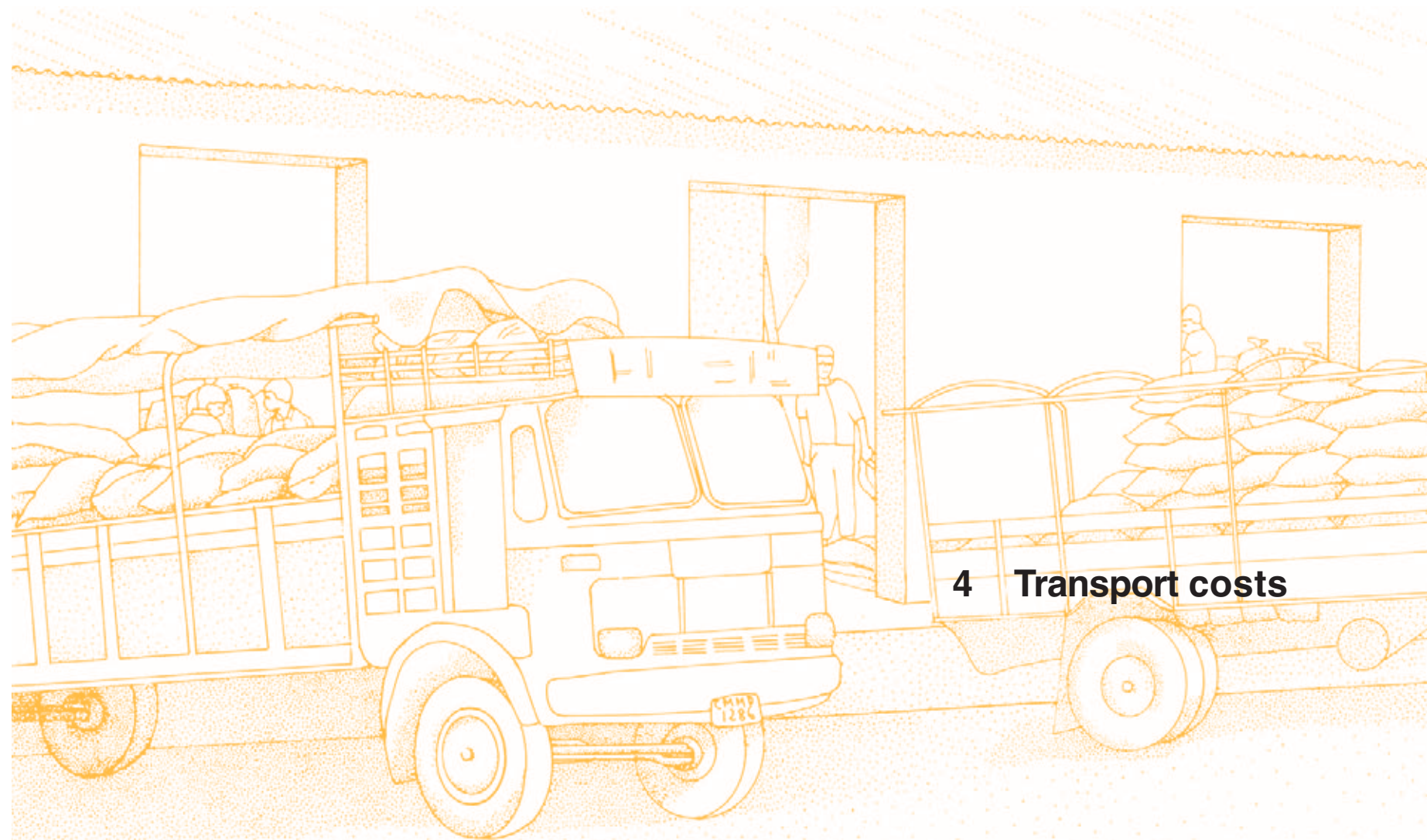

Produce is repacked in wholesale market

Farmers' produce is packed in wholesaler's containers

Stored produce is prepared for transport

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4   Transport costs

Trucks unloading
at a wholesale market

Transport costs are incurred by farmers when they take their produce to the market and by traders as they move the produce down the marketing chain to the consumer. Sometimes transport costs are very obvious because they involve the direct payment by a farmer or trader to a truck owner or, in some cases, boat owner on a per piece basis. In other cases such costs are less direct, for example when traders or farmers own and operate their own vehicle.

In other situations there is no financial outlay but there is still an *opportunity cost*. For example, when a farmer uses animal transport, a bicycle or even carries the produce to get to an assembly market he or she could be doing other things. This is a relevant marketing cost if the farmers have the possibility of selling produce at the farm gate but feel their income will be higher if they take it to the market. However, if the farmer has no alternative to going to the market then the time spent can be more properly regarded as part of the costs of production. If farmers don't go to the market they will not be able to sell their produce.

Payment to truck drivers to carry produce to market on a "per piece" basis makes for easy marketing cost calculations but is usually a more expensive way of transporting produce. Truckers have no idea whether they will fill their trucks or not and so calculate their charges "per-piece" by assuming an average load over the season or year that is less than the capacity of the vehicle. Thus traders or farmers working in groups can, if they are sure they can fill a vehicle, save on transport costs by joining together to hire one. Generally, the larger the truck they can hire and fill, the cheaper the per unit transport costs. Extension officers involved with marketing can play an important role by helping farmers or traders to organise to do this.

When produce is carried on a "per-piece" basis it is a simple matter to divide the cost per container by the number of kilograms in the container. When a truck is hired or traders use their own, the calculation is more difficult because the vehicle may be used for several different commodities, each packed in a different-sized container. For most trucks the factor limiting quantities carried is space available, not weight. Thus products which have a low weight-for-volume ratio (for example green peppers) should be costed at a higher per kilogram cost than produce which is heavier in relation to its volume. This requires making a rough estimate of the volume of the containers used for each commodity. The space available in the truck (minus an allowance for space that cannot be filled because of

In the marketing chain you can find virtually every kind of transport being used

Bicycle

Animal cart

Boat

Pack animal

Truck – train

Plane

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the shape of the containers, etc.) can then be divided by the volume of the container, so allowing the cost per kilogram to be worked out. An example of this calculation is shown in Figure 2.

The calculation becomes more complicated when traders own their own vehicles and we have to assess their transport costs. There are so many factors to consider in working out the costs per kilogram for one journey that this is best avoided unless there is no alternative information available to allow the cost to be estimated. If, for example, some traders use their own transport while others hire trucks on a "per journey" or "per-piece" basis then you can use the costs of the latter as a "best guess" of the costs to truck-owning traders.[1]

Because traders and truck owners are often accused of overcharging it is important to be aware of the transport costs they face. These include:

- wages paid to the driver and, where relevant, his assistant;
- cost of fuel, maintenance, repairs and the like;
- cost of licences, road tax, insurance and other necessary payments;

- cost incurred *en route* such as tolls or bribes paid at official or unofficial road blocks and charges for entering a market;
- the capital cost of the vehicle. When working out the yearly cost of operation of a truck you need to include not only the cost of bank interest paid on a loan but also the annual depreciation (or loss of value) of the truck. When roads are bad trucks may last only a few years and thus depreciation will be a major cost.

Having identified annual transport costs it is then necessary to consider the amount of work the truck will do in one year in order to work out a cost per tonne per km. This will depend on:

- the periods in which produce is available to be marketed;
- the other uses (if any) to which the truck can be put on return journeys or when not being used for agricultural marketing;
- the days the truck is unavailable due to breakdowns, repairs, services and the like;
- when both produce and the truck are available, the number of journeys and kilometres the truck will be able to do.

Figure 2
Calculating transport costs

Assume that there are **40 m³** available in the truck to be used and that it costs **$500** to hire the truck. A container of **0.2 m³** holds **8 kg** of tomatoes and a container of **0.4 m³** holds **10 kg** of green peppers. A full truck could hold 200 containers of tomatoes **(40 m³ ÷ 0.2 m³)** and 100 containers of green peppers **(40 m³ ÷ 0.4 m³)** .

Then the transport cost for **tomatoes**
per container and per kilogram is ...

$$\$500 \div (40 \text{ m}^3 \div 0.2 \text{ m}^3) = \$2.50 \text{ per container}$$
and
$$\$2.50 \div 8 \text{ kg} = \$0.3125 \text{ per kilogram}$$

While the transport cost for **green peppers**
per container and per kilogram is ...

$$\$500 \div (40 \text{ m}^3 \div 0.4 \text{ m}^3) = \$5.00 \text{ per container}$$
and
$$\$5.00 \div 10 \text{ kg} = \$0.50 \text{ per kilogram}$$

As can be seen, there are numerous individual costs which can combine to make produce transport extremely expensive. In many cases transport will be the most important marketing cost. It is therefore vital that the cost is calculated correctly. Expensive mistakes can be made if, for example, a village cooperative decides to buy a truck to compete with traders. If it underestimates the costs of operating the truck or over-estimates the amount of produce it will handle it could end up with a large loss.

This is the simplest form of transport – it also costs money
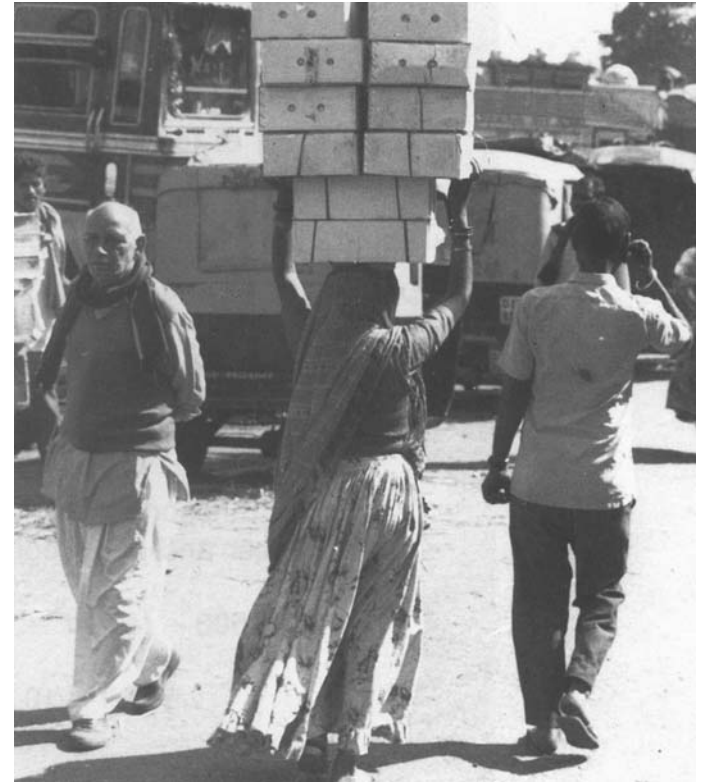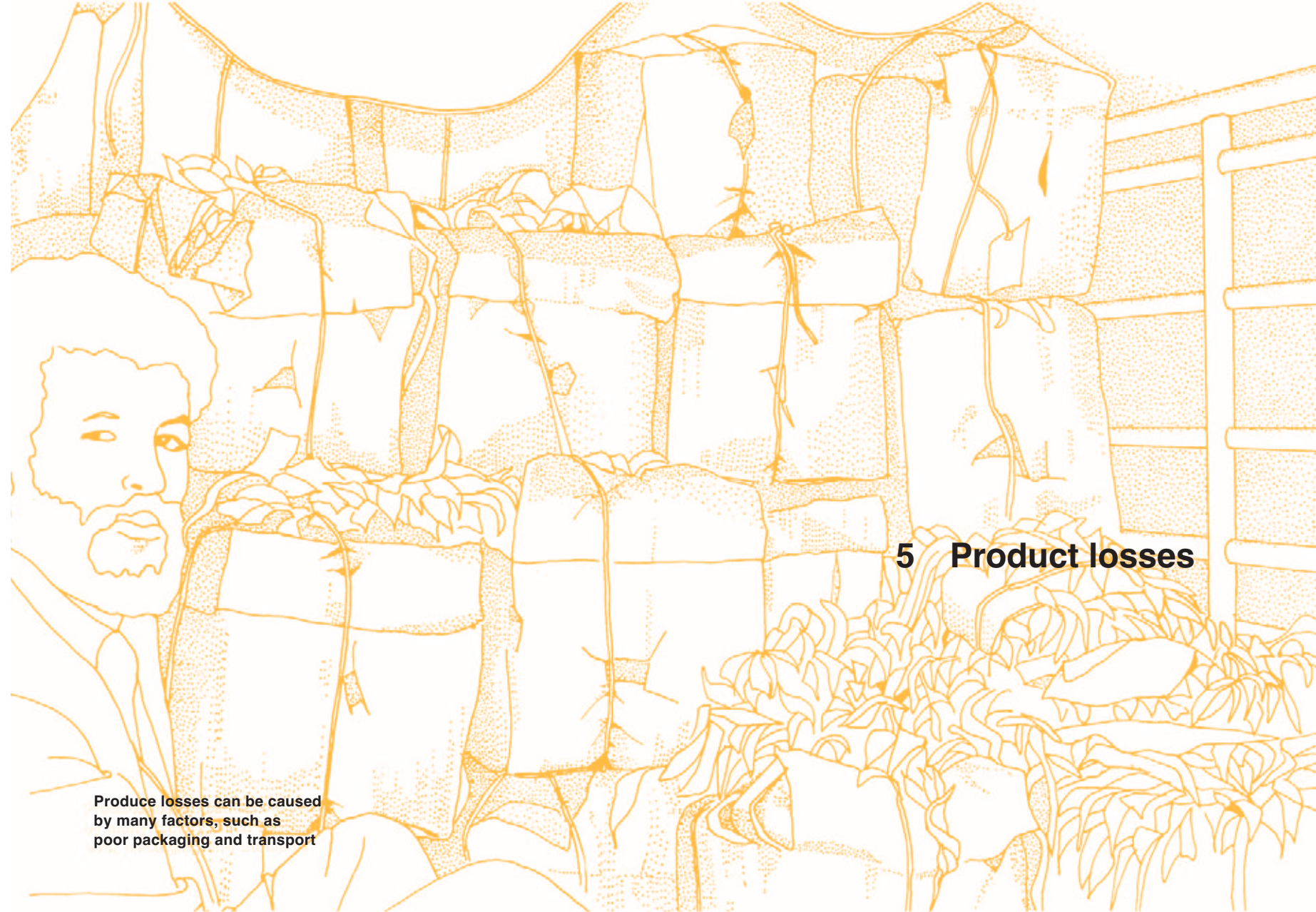
5 Product losses

Produce losses can be caused
by many factors, such as
poor packaging and transport

If a trader buys one kilogram of produce from a farmer, how much of that one kilogram will he or she actually end up selling? And what will be the average price of what he or she sells? Post-harvest losses of produce, particularly fresh produce, can be quite considerable, both in terms of quantity and quality (which will affect the selling price).

The causes of losses are many and varied and will not be considered in detail here.[2] One of the biggest causes is often the fact that the farmer produces more than the traders want to buy or the traders buy more than they can sell to the consumers. When there is a surplus, physical losses will be high and/or farmers and traders will have to sell at a loss.

Poor harvesting techniques and bad handling on the farm (bruising, exposure to the sun) can mean that much damage has been done even before the produce is sold to the trader.

Poor handling by the trader and his employees can make the situation worse. When truckers are paid on a "per piece" basis, farmers and traders try to squeeze as much as possible into the package. This can be a

Produce which has been badly packed and handled loses its value at the market

**Produce which has been
well packed and handled
obtains higher prices at the market**

false economy as the loss resulting from the damage caused can exceed the savings in transport costs. Produce can be damaged in transit, by the constant shaking on bumpy roads, by exposure to sun on top of a bus, and by high temperatures inside a truck or other vehicle (if a truck breaks down and has to sit at the side of the road for two or three days the entire consignment could be lost). Delays and bad handling at the wholesale market can make things worse. Sometimes, for example, produce that has been well packed by the farmer or the trader is simply thrown onto a heap on the floor of the wholesaler's premises, causing further bruising and damage.

At all stages of the marketing chain some produce will be thrown away. This may be planned, as in the case of cabbage leaves, but in most cases it will be the result of losses caused by bad handling. Sorting should occur at all stages of the marketing chain to separate damaged from good produce.

Losses in weight can occur even if produce is not thrown away. Most crops lose weight during transit and storage as the result of moisture loss. This is not necessarily a bad thing. For example, grain can be stored better when dry. But it does mean that a kilogram of produce purchased from a farmer is not equal to a kilogram sold to a consumer by the trader.

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Therefore, you should try to estimate the losses. This will not be easy unless you are able to follow consignments all the way through the marketing chain. Also, losses will vary according to the season; poor quality fruits which are unsaleable during a glut may well be saleable when there is a shortage. Most Ministries of Agriculture have assessments of losses and these can be used as a starting point for estimates. However, there is often a tendency to exaggerate losses, so official figures should be treated with caution.

The best way to treat losses is one that enables you to compare the quantity eventually sold with the quantity bought from the farmer. It gives the most accurate calculation and also means that the costs involved in packing, transporting, handling and storing produce which is eventually lost are included. An example of this calculation is shown in Figure 3, together with the more usual, and wrong, method of calculation.

Figure 3
Calculating the cost of product losses

Assume that, at **10 percent** loss levels, **1 kg** of tomatoes purchased by the trader from the farmer results in **900 grams** (0.9 kg.) available for sale to consumers. The trader buys tomatoes from the farmer at **$5 per kilogram** and marketing costs are $2 per kilogram for the tomatoes originally purchased. The selling price of tomatoes is **$8 per kilogram.**

Then the costs are ...

Figure 3, continued

1 kg purchased at **$5 per kg**	=	$5.00
1 kg packed and transported at **$2 per kg**	=	2.00
Total Costs	=	$7.00
Sales Revenue or **$8** x 0.9 kg	=	7.20
Thus the margin to the trader	=	$0.20

Below is an example of the more usual,
and wrong, method of calculation.

1kg purchased at **$5 per kg**	=	$5.00
1kg packed and transported at **$2 per kg**	=	2.00
10 percent losses or **$5** x 0.1	=	0.50
Total Costs	=	$7,50
Sales Revenue or **$8** x 1 kg	=	8.00
Thus the margin to the trader	=	$0.50

The second calculation is clearly wrong
because here the trader is seen to be obtaining revenue
from produce which has already been "lost".

Note: We will return to the correct methology in Chapter 9 where a
worked example of a marketing cost calculation is given.

**Product losses
may occur during transport**

Separating undamaged produce
from damaged produce

There are quality as well as quantity losses. Quality losses reveal themselves when the trader has to sell part of a consignment at a lower price than the rest. This could be because some produce is damaged in transit, because produce deteriorates over the period it is being sold or because the trader expects that it will deteriorate before there is another opportunity to sell it. In many countries perishable fruits and vegetables are sold at low prices on Saturday evenings because markets are closed on Sundays. Such produce may be unsaleable on the Monday morning because it has to compete with fresh produce.

In estimating the price the trader receives for produce that was probably purchased from the farmer at a fixed price per kilogram, you must therefore take account of the fact that all of the consignment is unlikely to be sold at one price. Not only will there be price variations due to quality differences but prices will vary according to supply and demand in the market. To calculate the average price the trader receives you must therefore calculate a weighted average price. An example of this calculation is shown in Figure 4.

Figure 4 shows a very different picture of trader revenue than if we had used the price of the first sale, which would probably have been at $2 per kilogram.
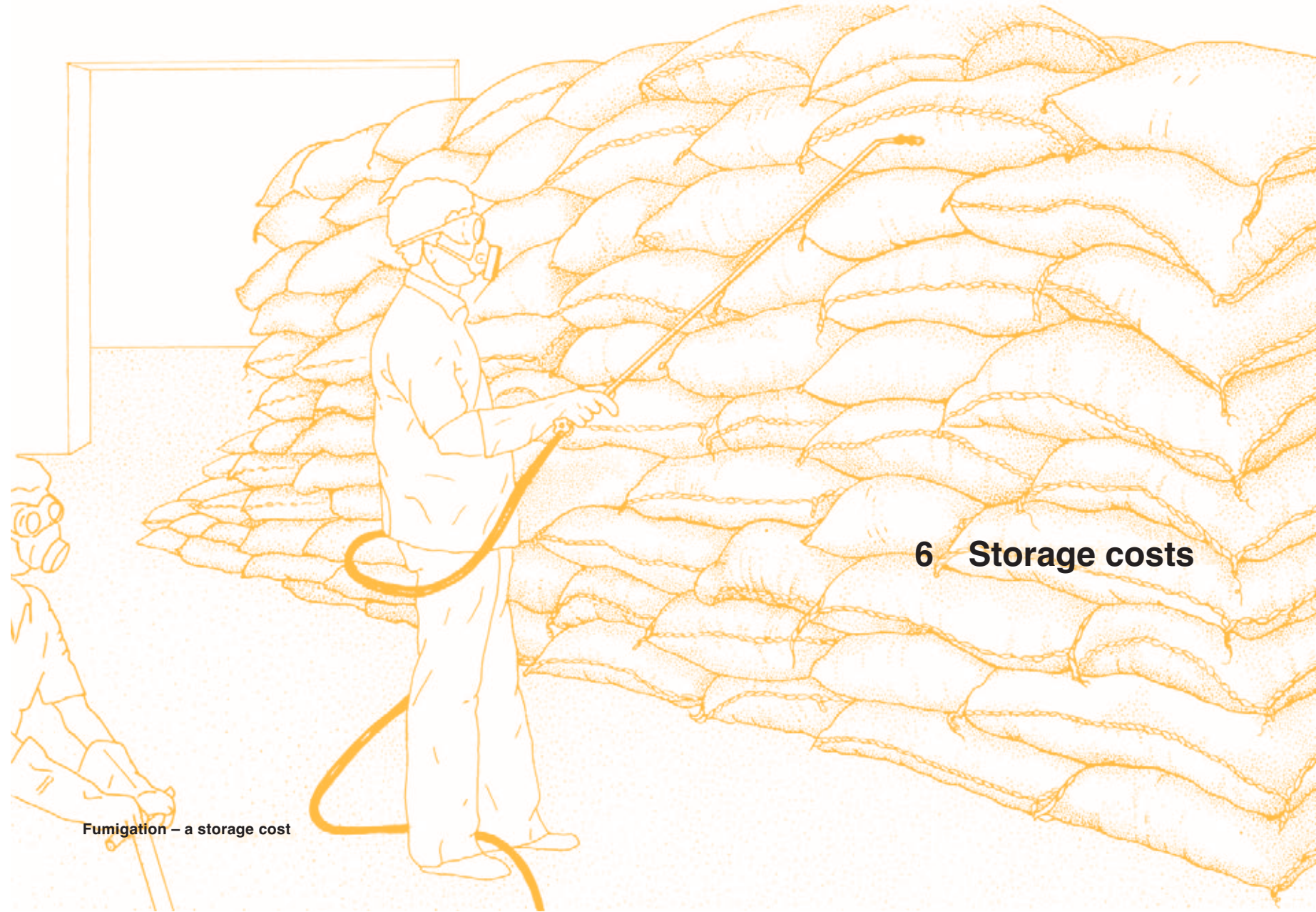
Figure 4
Calculating weighted average selling price

Assume an example involving a consignment of **100 kg** of tomatoes as follows ...

50 kg sold at $2.00	=	$100
20 kg sold at $1.40	=	28
20 kg sold at $1.00	=	20
5 kg sold at $0.40	=	2
(**5 kg** which cannot be sold)		–
Total Revenue	=	$150

Then the average selling price per kilogram is ...

$$\$150 \div \textbf{100 kg} \quad = \quad \$1.50$$

Fumigation – a storage cost

6 Storage costs

Storage is carried out in order to extend the period of availability of a crop to a consumer. In the case of staple food crops long-term storage is, of course, essential. The harvest period may be just a few months but the staple has to be consumed throughout the year. Storage can be carried out by the farmer, the trader, the mill or the consumer. With regard to more perishable crops, storage can be used to extend what is often a short period of availability. However, this is only viable when the produce can be sold after storage at a price higher than the into-store price, with the difference *fully covering the costs of storage, as well as offering an incentive to take the risk that a loss may result.*

Storage costs fall into four categories:

- costs associated with the physical operation of the stores; that is the actual cost per kilogram which must be paid to place the produce in the warehouse or cool store. Such costs are made up of factors such as depreciation on the building, security costs, electricity and other utility costs and maintenance;
- costs associated with the maintenance of the product quality while it is in store… for example, the cost of chemicals;
- costs associated with loss of quality and quantity while the produce is in store;
- the financial cost to the owner of the produce while it is in store.

The biggest single factor affecting storage costs is capacity utilisation. Where a store is used frequently to full capacity costs per unit will be low. Where one is kept empty for much of the time costs will be high.

Where commercial storage facilities are used it is relatively simple to work out physical storage costs incurred by traders as they will be charged on a basis such as kilogram/days, box/weeks or tonne/months. The costs per kilogram for the period the produce is in store can then be worked out. Where the trader hires an entire warehouse and moves produce in and out you need to have an idea of the average number of containers/kilograms in store during the period for which the store is hired. An example of this calculation is shown in Figure 5.

There will usually be quantity losses while produce is in store. This may be deliberate (for example, when

Figure 5
Calculating storage costs

Assume that a warehouse is hired for **120 days** of the year at a total cost of **$600** and that the weighted average contents are **250 bags** of potatoes.

Then the storage cost is ...

$600 ÷ 120 days   = $5.00 per day
$5 ÷ 250 bags   = $0.02 per bag/day

grain is dried so that it will store better) or accidental, due to bad storage. With fresh produce some quantity loss is almost inevitable, however efficiently it is stored. Physical losses in storage need to be treated as costs in the way outlined in Chapter 5. Quality losses are also inevitable and for the trader these are reflected in the prices he or she receives. As shown in Chapter 5, it is important to get an accurate estimate of the *weighted* average price stored produce is eventually sold at.

It is easy to ignore the fact that produce while in store incurs a financial cost for the trader. To do so, however, would give a totally inaccurate impression of marketing costs. An example of a realistic calculation of storage costs including additional costs such as bank interest is shown in Figure 6. This example assumes that there is no loss. However, a four-month period of storage will almost certainly lead to some losses and these need to be built into the calculations.

Long-term storage

Short-term storage

Figure 6
Calculating storage costs over time

Assume that a trader buys potatoes at **$10 per bag** and keeps them in store for **4 months.** To do this he or she has to borrow money at **12 percent per year.**
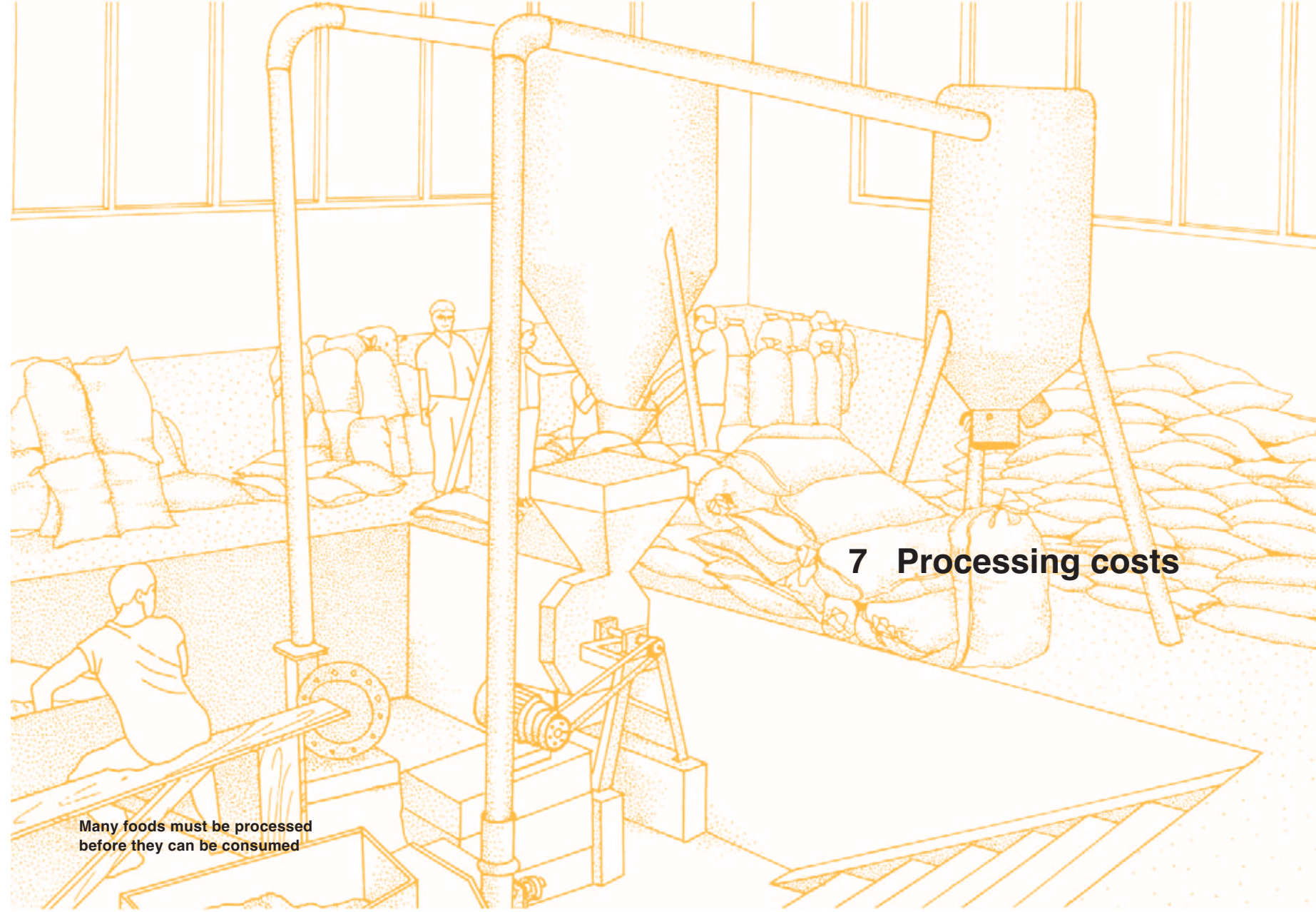
Then the cost of bank interest is ...

$10 x 0.04 (12% p.a. over 4 months) = $0.40 per bag

Thus a realistic calculation
of storage costs per bag
for our consignment of potatoes is ...

Storage charge for 120 days at $0.02 per day	**=**	**$2.40**
Interest charge of $0.40 per bag	**=**	0.40
Total cost per bag	**=**	**$2.80**

7 Processing costs

Many foods must be processed
before they can be consumed

The transformation of a product from one form to another clearly involves costs associated with the operation of the processing facility. In calculating marketing costs, however, we need to consider two other important aspects of processing costs. Firstly, as with product losses, one kilogram of product purchased from the farmer cannot be compared with one kilogram of processed product sold to the consumer. We therefore need to ask, "how much will be sold to the consumer if one kilogram is bought from the farmer?" Secondly, there may be a by-product as a result of the processing and this by-product can often be sold. The value of the by-product must therefore be included in the calculations.

The costs of the food in very sophisticated processed food products sold in supermarkets (for example "ready-to-eat" meals) can be a very small proportion of the retail selling price, sometimes less than ten percent. Processing, packaging and other marketing costs absorb the rest. However, in this Guide we shall concentrate on the cost of primary processing.

Some examples of primary processing are:

- paddy into milled rice (conversion at 65-70 percent; by-product bran);
- maize into maize meal (conversion at 65-85 percent depending on quality of meal; by-product bran);
- green tea into black tea (conversion rate 28-32 percent; no by-product);
- cotton into lint (conversion rate 30-35 percent; by-product cotton seed);
- cherry coffee into green bean (conversion rate approximately 18 percent; no by-product);
- copra into coconut oil (conversion rate 60-65 percent; by-product copra cake);
- soybeans into oil (conversion rate around 18 percent; by-product soya meal);
- oil palm into palm oil (conversion rate 18-24 percent; by-products palm kernels and oil cake).

In calculating processing costs we need to know the *conversion rate,* the *quantity of by-product,* the *value of that by-product* and the *costs of processing.* An example of this calculation is shown in Figure 7.

Figure 7
Calculating processing costs

Assume that a rice milling operation converts paddy at the rate of **70 percent** (0.7) and has saleable by-products equal to **25 percent** of the paddy weight. Processing costs per kilogram of paddy have been calculated at **$0.20 per kilogram** on the basis of the mill's total annual costs divided by the number of kilograms of paddy processed. The buying price of the paddy was **$1.50 per kilogram** and the by-products have a value of **$0.50 per kilogram.**

Then the processing cost per kilogram of paddy is ...

One kilogram of paddy purchased	=	$1.50
Processing costs or **1 kg** x **$0.20**		0.20
Total Costs	=	$1.70
Less the by-product revenue of **1 kg** x **0.25** x **$0.50**	=	0.12
Break even selling price per kilogram of paddy	=	$1.58

Thus the break even selling price per kilogram of milled rice is ...

$1.58 ÷ **0.7** = $2.25

Of course, it will not always be possible to obtain reliable information on a miller's costs. These will include not only operating costs such as fuel, maintenance and repair but also labour costs, the cost of the capital investment in the mill and its premises, and the *opportunity* cost of the owner's time. Calculating total costs from all these individual costs cannot be realistically done by an extension worker. However, you can perhaps get information about milling costs. Ministries of Agriculture may have model budgets for mills, according to their size, as may banks that lend money to mill owners. These budgets can be modified according to circumstances and throughput of the particular mill.

Calculating processing costs is just as important for small operations as for large factories

Village processing in West Africa
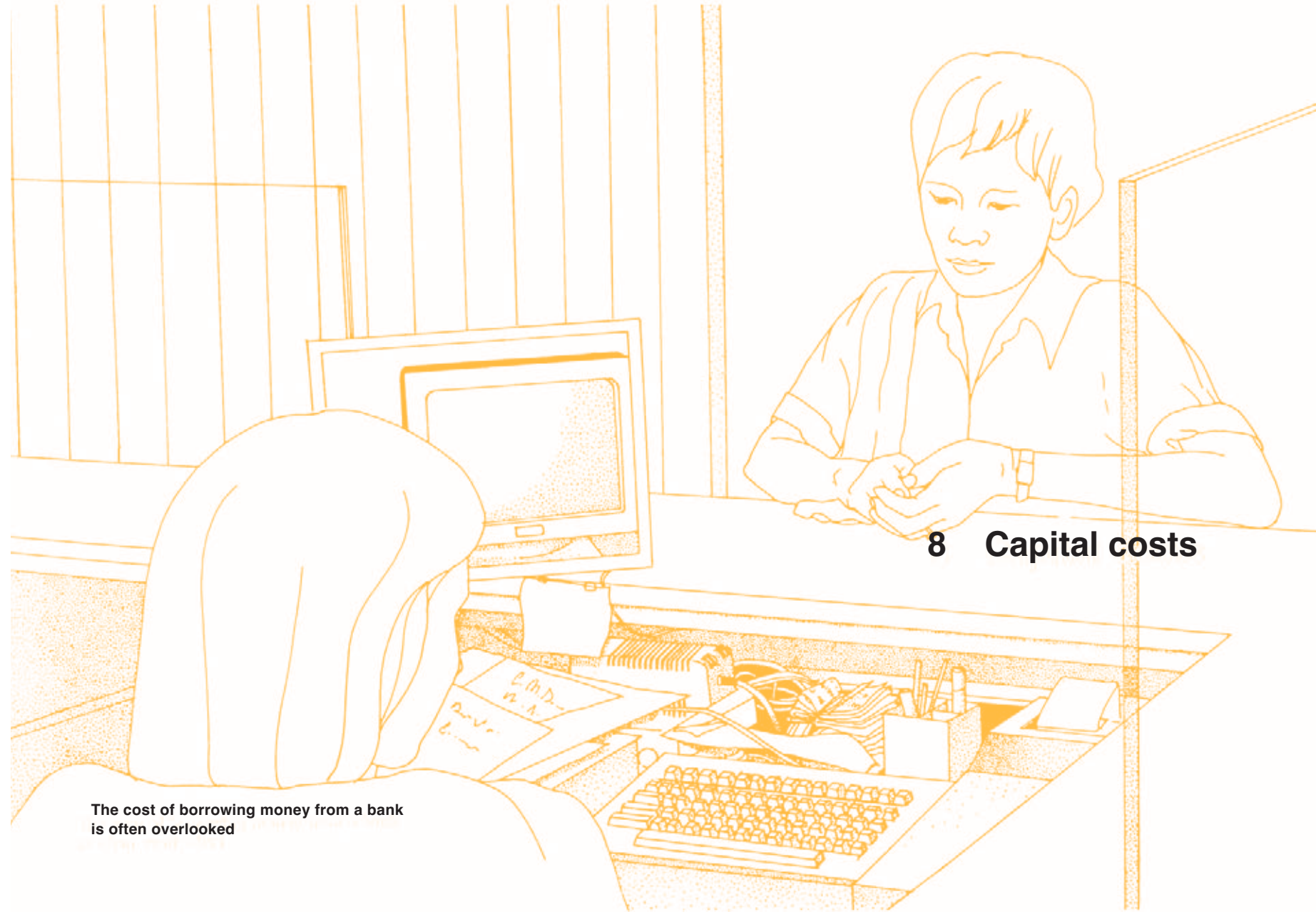
8   Capital costs

The cost of borrowing money from a bank
is often overlooked

We have already hinted that capital costs are a major component of marketing costs. Such costs will vary from country to country depending on the level of interest rates. They include:

- The cost of money needed to buy produce and keep it in store. Many small traders buy produce, sell it and use the proceeds to buy more, so their needs for operating capital are limited. Traders who buy produce and store it for lengthy periods will, on the other hand, have sizeable operating capital requirements. In some countries traders buy from farmers in advance of the harvest, that is they buy the "field" or the "tree". Thus they will have to finance the produce they buy for even longer periods and their marketing costs will, consequently, be higher;
- The capital cost of a warehouse or a truck if the trader owns them;
- The capital cost of other buildings or of equipment, such as office space, weighing scales, grain drying equipment;
- The depreciation (or loss of value) of the vehicle, warehouse or equipment owned by the trader, miller, or others.

The calculation of capital costs for a small consignment of produce is far too complex an operation when the aim of the exercise is simply to work out marketing costs of vegetables from a group of farmers to a nearby urban market. As noted in other chapters it is best to use commercial rates for the hire of services, such as transport rates, storage rates or contract milling charges, even if traders are using their own vehicle or other facilities. These commercial rates will already have capital costs built in by the trucker, warehouse owner, or others.

However, extension workers may be asked to advise a Cooperative on whether to build a store, construct a maize mill or purchase a truck. Under these circumstances it is necessary to compare the capital and depreciation costs with the expected annual return from the Cooperative's activities after the direct operating cost have been covered. Capital costs are the interest paid to the bank on the loan. Assuming interest rates stay constant, this interest can be estimated in advance on a yearly basis if you know how much of the "principal" (that is, the total amount borrowed) is paid back every year.

Depreciation can be calculated on a "straight line" basis. Here, the life of the vehicle or building is estimated and its cost, minus its "salvage" or "scrap" value

at the end of its working life, is divided by the number of years of its life to get the annual depreciation. An alternative, and more accurate, approach is to assume depreciation at a fixed percentage per year. In this way the value goes down more rapidly in the early years than later. If, for example, a $10 000 truck is depreciated at 10 percent then the depreciation in the first year is $1 000 and in the second year $900 (that is 10% of $10 000 - $1 000).

Even if depreciation is taken into account, a calculation could still give a misleading impression of an organization's profitability. This is particularly the case in countries with high inflation levels. If an asset is depreciated on the basis of its purchase price this will underestimate the funds needed to replace the asset when it can no longer be used. For instance, a truck costing $10 000 now will cost more than $60 000 to replace after ten years if inflation is 20 percent per year. In this case the truck should be revalued at its assumed replacement value and the revalued figure should be depreciated as above.

Interest payments and depreciation on a truck are often significant costs faced by a trader

9　A marketing cost calculation

**After all individual costs
have been identified
it is possible to work out total costs**

Once all the costs have been calculated it is then necessary to put them together to work out total marketing costs. The calculation will vary according to the complexity of the marketing channel, whether there is processing or not, and how many intermediaries there are. Figure 8 shows one of many possibilities.

The *gross profit* of the wholesaler and retailer has, of course, to cover all costs which cannot be calculated on a per kilogram basis. These occur over a year and can only be apportioned with great difficulty to individual commodities. Operating capital and licence fees would be incurred by the wholesaler, while, among other things, the retailer would have the expenses associated with renting and running a shop. Thus the *net profit* made by both would be much less.

Figure 8
A cost calculation

Assume that farmers growing tomatoes wait at the side of the road for traders to come and buy from them. They carry the tomatoes to the road in baskets and sell to traders at $0.50 per kilogram. Traders repackage the tomatoes in reusable wooden boxes containing 10 kg. The traders then take the tomatoes to a wholesale market where they are bought by retailers at an average price of $0.90 per kg. These retailers supply their own boxes to transport the tomatoes to their shop or stall and sell tomatoes to consumers in plastic bags each containing 500 grams. Losses are considerable. While with the traders they amount to 10 percent so traders sell only 0.9 kg of every kilogram purchased. The retailers lose a further 10 percent of what they purchase so they sell 0.81 kg of every kilogram purchased by the trader from the farmer. The average retail selling price is $1.17 per kg.

Figure 8, continued

	Per kg purchased from farmer
Purchase of tomatoes from farmers (1 kg x $0.50)	$0.50
Packaging ($0.50 ÷ 10 kg box)	0.05
Labour employed by wholesaler to pack, load and unload	0.02
Transport to wholesale market ($1.50 per box ÷ 10 kg)	0.15
Costs en route such as road blocks	0.01
Market fees	0.01
Market agent's fees	0.02
Total costs	$0.76
Quantity sold (0.9 kg x weighted average selling price of $0.90 per kg)	0.81
Trader's gross profit	$0.05
Retailer's buying price ($0.90 x 0.9 kg)	$0.81
Market fees	0.01
Packaging from market to shop	0.02
Porter's fees in market	0.01
Transport to shop (0.9 kg x $0.50 per 10 kg box)	0.04
Weighing, cost of plastic bags, and retail packaging (for 0.81 kg)	0.02
Total costs for retailer	$0.91
Revenue from sale of 0.81 kg (0.9 kg x 0.9) at a weighted average selling price of $1.17 per kg	0.95
Retailer's gross profit	$0.04
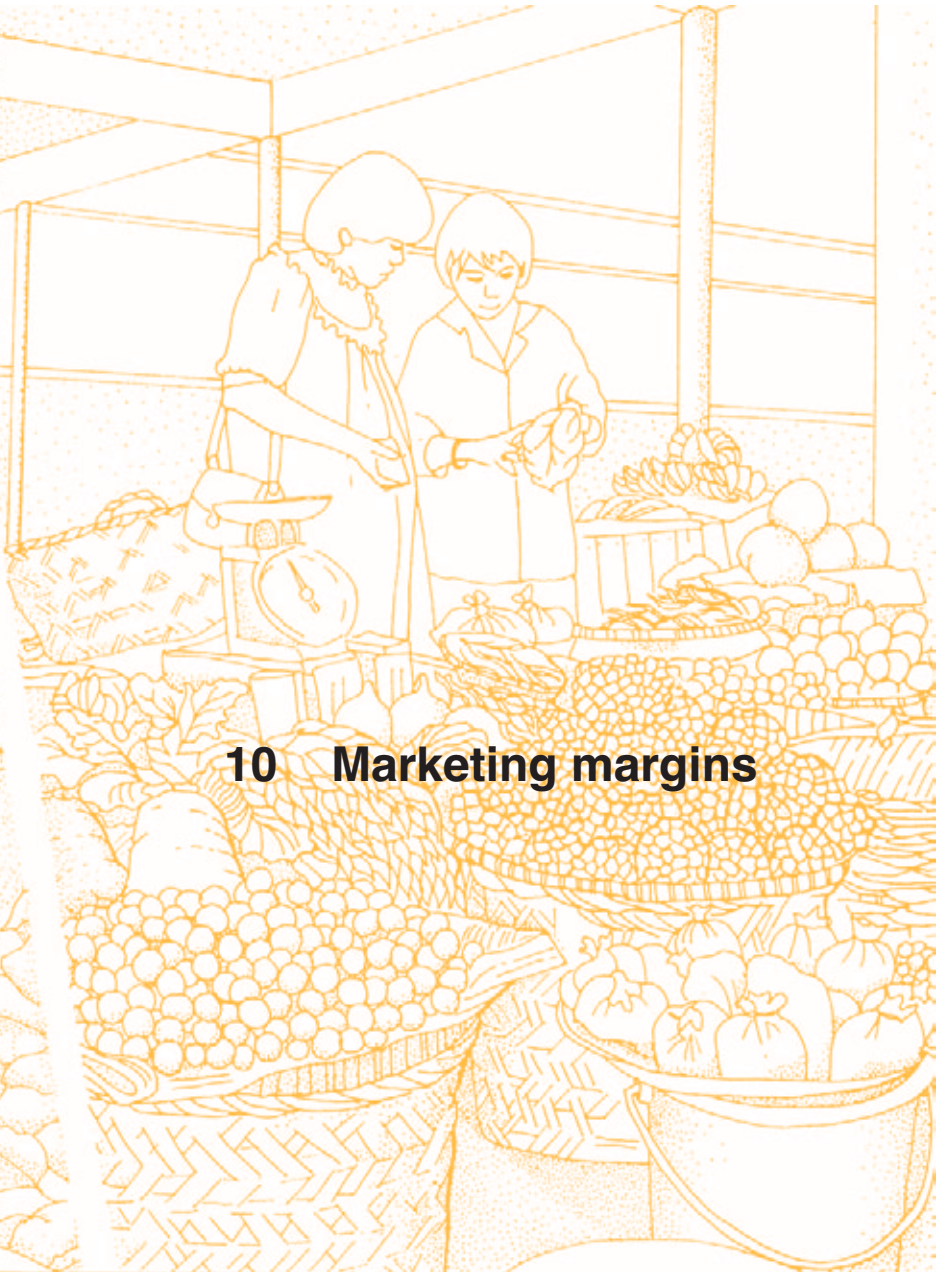
10   Marketing margins

Marketing margins must cover
all the costs involved
in moving produce from farmer to consumer

A marketing margin is the percentage of the final weighted average selling price taken by each stage of the marketing chain. The margin must cover the costs involved in transferring produce from one stage to the next and provide a reasonable return to those doing the marketing. An example of a margin calculation is shown In Figure 9.

"Margins" are often used in the analysis of the efficiency of marketing systems. Often they are misused even if they are calculated correctly. The presentation of a trader's share of the final selling price in percentage terms can give a totally misleading impression

Figure 9
Calculating marketing margins

These calculations are based on figures given in the previous chapter, that is, where the buying price from the farmer is $0.50 per kg, the weighted average wholesale selling price is $0.90 per kg and the weighted average retail price is $1.17 per kg (see Figure 8).

Share to the producer	$0.50 ÷ $1.17	=	0.427 or 43%
Wholesale margin	($0.90 − $0.50) ÷ $1.17	=	0.342 or 34%
Retail margin	($1.17 − $0.90) ÷ $1.17	=	0.230 or 23%
	Total margin	=	0.572 or 57%

Looking at margins and changes in margins cannot tell you that there is a problem. It can only suggest that there may be a problem which requires further investigation by studying the marketing costs. For example, in recent years many countries have reduced the role of grain marketing boards and increased private trader involvement in grain marketing. A comparison of margins under the old system with those under the new marketing channels may show that marketing margins are higher under private traders. A little knowledge is a dangerous thing, so on the basis of this margin comparison, people may argue for a return of the marketing board. They may think that traders are making excessive profits. But, the marketing board was probably making a loss every year. Its margins were low because its costs were not fully reflected. The government may have had to write off the loss made by the board, something which would not be done for the private sector. Also, changes from government to private marketing have often been part of "Structural Adjustment Programmes" which have frequently led to rapid rises in interest rates. The marketing board may have used subsidised low interest loans, the private traders now have to pay the full cost of capital. Moreover, under structural adjustment, currencies have often been devalued heavily. This puts up the cost of capital items, such as trucks, and inevitably leads to higher marketing costs.

unless you know the costs involved. Often people who research marketing costs and margins start out with the assumption that traders exploit farmers. When they look at the margins they may think they have found the proof. The calculation in Figure 9 could, for example, be written up as "traders keep more than half the income from tomato sales." Such analysis could then be used to try to justify government intervention in marketing, whether it be to establish minimum prices or to start a marketing board. Yet, as we see from Chapter 9, it is quite possible to arrive at such margins with reasonable costs and very small *net profits* for the two traders invoved.

Because margins are expressed in percentages they appear to be high. And because a "reasonable" marketing margin may have been estimated at some time there is a tendency not to accept that such margins can and must change. For example, some governments have, in the past, announced that cash crop farmers will get a certain percentage of the export price. This percentage may have been established when prices for the cash crop were high; it no longer remains use-ful if prices fall. If the farmer gets 80 percent of the export price of coffee when the on-ship price is $2000 a ton this permits a marketing margin of $400 a ton. If the world market price then collapses so that the on-ship price is $1000, an insistence that farmers get 80 percent will mean that the margin will not be enough to cover costs. With the exception of operating capital costs, which will fall as the price goes down, marketing costs will stay more or less constant in money terms. Therefore, marketing margins will rise in percentage terms although staying constant in monetary terms as the price falls.

As is explained in the box on page 57, increases in marketing margins due to increases in marketing costs may not mean increases in profits made by those doing the marketing. Moreover, where farmers receive only a comparatively small share of the selling price this does not necessarily mean that they are being exploited. Total margins will depend on the length of the marketing chain, the extent to which the product is stored or processed, and the level of post-harvest losses. *To know whether margins are reasonable you need to understand the costs.*

Endnotes

1. For detailed suggestions on cost calculation see *Costs, Margins and Returns* by Lawrence Smith, Marketing and Agribusiness Development Paper No. 1, FAO, Rome.

2. For more information relating to horticultural crops see *Prevention of Post-Harvest Food Losses - fruits, vegetables and root crops,* FAO Training Series No. 17/2, Rome, 1989.

These documents can be requested by
e-mail to AGS-Registry@FAO.org

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The following is a list of booklets published in the
MARKETING EXTENSION GUIDE series:

A guide to MARKETING COSTS
and how to calculate them
1993, 59 pp. (E F S)

MARKET RESEARCH
for agroprocessors
2003, 114 pp. (E S)

A guide to MAIZE MARKETING
for extension officers
1999, 111 pp. (E F)

Planning and designing
RURAL MARKETS
2003, 120 pp. (E S)

Understanding and using
MARKET INFORMATION
2000, 85 pp. (E F S)

HORTICULTURAL MARKETING
2005, 131 pp. (E S)

Available in: E – English
              F – French
              S – Spanish

Series editor: Andrew W. Shepherd   http://www.fao.org/ag/ags/subjects/en/agmarket/agmarket.html

The Guide explains in a simple way the concept of marketing costs. It provides brief advice on how to calculate such costs. Marketing margins are also discussed. In part, the aim of the Guide is to correct some of the widely held misunderstandings over marketing costs. Traders' margins are often looked upon as being excessive. Frequently, this is because the observer lacks a full appreciation of all the costs involved. The Guide should also be particularly useful to marketing officers and extension workers who are called upon to advise farmers on marketing and prices