MATCOM

COST ACCOUNTING AND CONTROL

material for management training in agricultural co-operatives

TRAINER'S MANUAL

international labour office, geneva

by Malcolm Harper

MATCOM
Material and techniques for cooperatives management training

The MATCOM Project was launched in 1978 by the International Labour Office, with the financial support of Sweden. In its third phase (1984-1986) MATCOM is financed by Denmark, Finland and Norway.

In collaboration with cooperative organizations and training institutes in all regions of the world, MATCOM designs and produces material for the training of managers of cooperatives and assists in the preparation of adapted versions for use in various countries. MATCOM also provides support for improving the methodology of cooperative training and for the training of trainers.

Preface

This training package is one of a number of training packages designed by the ILO-MATCOM Project to assist people who plan or carry out training for the managerial staff of agricultural co-operatives in developing countries.

The training provided under this training package, as well as under the other packages in this series, is based on a thorough analysis of:

(i) the tasks and functions to be performed in agricultural co-operative societies in developing countries;

(ii) the common problems and constraints facing the effective performance of these tasks and functions.

The result of this analysis is reflected in the MATCOM "Curriculum Guide for Agricultural Co-operative Management Training". The Guide contains syllabuses for 24 management subjects and MATCOM has produced training packages, similar to this manual, for the following subjects:

- Collecting and Receiving Agricultural Produce
- Transport Management
- Storage Management
- Marketing of Agricultural Produce
- Supply Management
- Rural Savings and Credit Schemes
- Staff Management
- Financial Management
- Cost Accounting and Control
- Risk Management
- Project Preparation and Appraisal
- Work Planning
- Export Marketing
- Management of Larger Agricultural Co-operatives

For more information on the above training material, please write to:

The MATCOM Project
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International Labour Office
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THE TRAINING PROGRAMME

1. The Target Group

This training programme is designed to assist in the training of anyone who has responsibility for cost accounting and control in agricultural co-operative societies. This may include co-operative advisors and auditors, managers, assistant managers, accountants and other staff who are involved in this activity.

2. Aim

The aim of the programm is to enable trainees to design, operate and make effective use of simple cost accounting systems.

In particular, the course should improve trainees' abilities:

- to identify the relationships between costs and the volume of activity;

- to assess the variability of costs from past performance, and to prepare estimates of future performance;

- to distinguish between direct costs and "overheads",

- to select appropriate methods of allocating overhead costs to different activities;

- to determine appropriate cost centres within their co-operative societies, and to identify the appropriate ways of measuring their outputs;

- to design and operate systems for collecting the data necessary for a cost accounting system;

- to distinguish between changes in costs which are caused by volume, efficiency and by price and to suggest appropriate remedies when necessary;

- to identify marginal costs, and to take appropriate decisions based on them;

- to determine standard costs;
- to identify the causes of variances from standard costs, and to suggest appropriate changes when necessary;
- to determine the extent to which variances are caused by deviations in use or in cost;
- to adopt appropriate strategies for cost reduction, and to avoid inefficient approaches to the problem of excess costs.

3. Use

The course as described in this manual can be used for a specialised course on cost accounting. The complete programme, or individual sessions or parts of sessions, can also be incorporated in the curriculum for a more comprehensive management training programme.

4. Duration

The complete programme, as described in this manual, consists of 15 sessions. Session times vary from 1 to 22 hours. The total programme will take between 28 - 32 hours, or 5 - 6 days, depending on the qualifications and experience of the trainees and the hours worked each day. The time may well be exceeded, and each instructor must decide on the likely duration in view of local conditions.

5. Training Approach and Methods

The programme is based on the assumptions that training is expensive and that money for co-operative management training is scarce. Therefore, it looks upon training as an investment, and unless the training yields results, the return on the money invested in it will be nil.

On their return from the training programme, the trainees should be able to show concrete results of improved management. In order to prepare and equip the trainee to achieve this, the programme has adopted a highly active learning approach through the use of "participative" learning methods.

Trainees will not learn about Cost Accounting in a general and passíve way. Their day-to-day management problems have, as much as possible, been translated into realistic case studies and other problem-solving exercises. Trainees (working in groups and on their own) will learn by solving these problems with the necessary assistance and guidance from the trainer, who will act more as a "facilitator" of learning than as lecturer.

Every trainee has some ideas and suggestions from which the others can learn. This material is intended to allow and encourage every trainee to contribute as much as possible from his own insights and experience, so that all will go away with the accumulated knowledge that each brought to the programme.

This sort of shared learning is in fact almost always more important than the knowledge that you, the instructor, or the material itself, can contribute. You should treat each trainee as a source of ideas and suggestions which are at least as valuable as your own, and the material is designad to help you draw out, or "elicit", these contributions.

The built-in "action commitment" at the and of the programme will give each trainee the opportunity of using the knowledge and expertise of his colleagues in the training programme in order to find a concrete and acceptable solution to a specific cost problem he is faced with - a solution to which the trainee will commit himself for implementatíon.

6. Structure

The programme is dívided finto five TOPICS and each topic is covered by a number of SESSIONS (sea the table of contents on paga X).

The following material is provided for each session:

- a session guide for the trainer (yellow pages), giving the objective of the session, an estimate of the time needed and a comprehensiva "plan" for the session, including instructions on how to conduct the session;

- handouts (white pages) of all case studies, forms, etc., to be reproduced for distribution to the trainees.

7. Adapting the Material

Before "using" the programme in a real training situation, it will probably be necessary to adapt it. This can be done as follows:

Read through the material and decide whether:

- the programme can be run as ít is;
- only certain topics or sessions should be used;
- new topics and sessions should be added.

Your decision will depend on the training needs of your trainees and the means you have at your disposal.

Carefully read through the sessions you have decided to use. Check the subject matter in both the session guides and the handouts. Modify them to include local currencies, names, crops and so on. Such adaptation will help trainees identify themselves more easily with the people and the situations described in the handouts and will increase the impact and effectiveness of the training programme.

Do not feel that this manual is like a book which contains the only answers. It is merely a collection of suggestions and ideas, which you must adapt, modify, use or reject as you 'think fit. The best evidence that you are using it properly will be the amount of changes, additions and amendments you have yourself written into this copy.

8. Preparing the Handouts and other Learning Aids

Handouts constitute an important part of the training material used in the programme. They can be reproduced from the original handouts supplied in the ringbinder, after the necessary adaptation has been made. Reproduction may be done using whatever method is available: stencil, offset printing, photocopy, or carbon copies or handwritten copies if no other method is available.

The only item of training equipment which is absolutely essential is the chalkboard.

Some suggestions for visual aids are given in the session guides. If flipcharts or overhead projectors are available, you should prepare these aids in advance. If they are not available you can still use the chalkboard.

The Pre-course Questionnaire should be sent to the trainees in advance. Trainees should be asked to complete it and hand it in at the beginning of the training programme.

9. Preparing Yourself

Some trainers may feel that material of this sort means that they need only spend a few minutes preparíng for each session. This is not the case.

You should go through the following steps before conducting any course which is based wholly or in part on this material:

1. Read it carefully; be sure you understand the content, and that you can envisage what is intended to happen in the classroom.

2. Work through all the calculations; be sure that you understand them completely and try to predict the errors that trainees are likely to make, and the different answers which may not be wrong, but which will be worth following up.

3. Work through the case studies yourself, and try to predict all the possible analyses and answers which trainees may come up with.

4. Look up and write down on the material itself, as many local examples as you can to illustrate the points that are raised.

5. Plan the whole session very carefully; try to predict approximately how many minutes each section of the session is likely to take, and make the appropriate modifications to fit into the time that you have available. Do not take the suggested time at the beginning of the session too seriously.

10. Conducting the Programme

While using the material, you should try to observe the following guidelines:

1. Arrange the seating so that every trainee can see the faces of as many as possible of the others; do not put them in rows so that the only face they can see is your own.

2. Be sure that the session is clearly structured in the trainees' minds; outline the structure at the beginning, follow it or say that you are diverging from it, and summarise what has happened at the end.

3. Bear all the learning points in mind, and do not forget the job-oriented objectives of the session.

4. Be flexible, do not follow the material slavishly and be prepared to change the approach, depending on what trainees, themselves, suggest.

5. Avoid, whenever possible, telling the trainees anything; in a successful session all the points will have been elicited from them by skillful questioning.

6. If you fail to elicit a particular answer from the trainees, it is your fault not theirs. Persist, by asking the same question in different ways, by hinting and so on, and only make the point yourself if all else has failed.

7. Use silence as a weapon; if nobody answers a question, be prepared to wait for 20 or 30 seconds in order to embarass somebody into making an attempt.

8. Avoid talking yourself. Trainees' discussion and suggestions should occupy around three quarters of the total time; ask, listen and guide rather than talk. (The more you yourself talk, the more you are revealing your own insecurity and ignorance of the subject, in that you are not willing to risk questions or comments with which you cannot deal.)

9. Never ridicule a trainee's answer or suggestion; there is bound to be some merit in it somewhere, and the very fact that he or she has put forward a suggestion is commendable.

10. If you cannot answer a trainee's question, or comment on a suggestion, (or even if you can) ask another trainee to answer or make a comment. You are the facilitator, not the source of knowledge.

11. Write trainees' own words on the chalkboard whenever possible; do not follow the words in the material, even if they are more precise.

12. Be prepared to act as "Devil's Advocate" by supporting the opposite view to that held by the majority of participants, there are usually no right or wrong answers to management questions, and trainees must see and understand both sides of every issue.

13. If trainees appear to be followíng a quite different track from that suggested in the material, do not dismiss this out of hand; it may be as useful or more so.

14. Call on the silent and, if necessary, silence those who talk too much.

15. Be sure that everybody understands what is going on; do not allow the discussion to be taken over by the few who understand.

16. Be dynamic, lively and active. Move around, walk up and down the classroom, and generally keep everyone alert by your physical activity.

11. After the Course

Note down each trainees action commitment. Be sure to contact every trainee, in person or at least by letter, about six months after the end of the course to find out how they have managed to apply what they have learned, and how well they are implementíng their action commitments. If they failed, it is not they who were at fault, but the course. Either the training was ineffective, the trainees were poorly selected or you failed to recognise problems which might prevent them from applying what they learned.

Seminar on

Cost Accounting and Control — Pre-course Questionnaire

Name: .....

Co-operative Society: .....

Brief description of your responsibilities:

.....

.....

.....

Even the best managed co-operative societies lack some cost information, and even the worst managed have some sort of control over some costs.

a) What important costs in your co-operative are generally well known and effectively controlled?

....

....

b) What costs are more or less unknown and uncontrolled?

....

....

As a result of attending the course on Cost Accounting, I hope that I shall be able to

.....

.....

Please bring to the course as much information as possible about your co-operative society's cost accounting systems. This should include:

- Annual accounts
- Copies of any regular cost reports

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topic

1

why cost accounting?

SESSION 1.1

INTRODUCTION

Objective: To demonstrate the importance of improved cost accounting and control in co-operatives, to ensure that all participants are aware of the objectives of the programme, to introduce trainees to one another and to ensure that all administrative details are in order.

Time: 1 to 2 hours.

Material: Completed pre-course questionnaire, timetable and a list of participants.

Session Guide:

1) The opening of the programme should be brief and to the point. The speaker should include the following points:

   - The need to improve results by higher revenues and lower costs.
   - The need to know, quickly, what money is being spent on.
   - The need to design costing systems which are simple to operate and easy to understand and use.
   - The need to relate costs to individual managers who are responsible for them.
   - The need to set prices in the knowledge of costs, and to be flexible in order to fill underused capacity.
   - The need for all staff, and members, to understand and control costs.

2) In order to exemplify the objectives and the contents of the course, confront participants with a number of questions like the following, and explain that the course will deal with problems of this type:

   - Do you now how your society's costs vary with the volume of produce handled?

- How long after each month do you know what costs have been?
- Does each manager or supervisor with some authority have rapid, simple, usable information about the costs he can control?
- Can you explain variations from budget?

3) Go briefly through the timetable, stressing to trainees that they will be required to contribute their own experience and ideas, and not merely to listen to other people talking. People learn by doíng, rather than by listening.

4) Ask each trainee to summarise his prior training and experience, and to state what he hopes to gain from attending thís course. Refer to the pre-course questionnaire if necessary. Identify the special experience that each trainee brings to the course, emphasising the point that the group as a whole is an extremely powerful source of expertise and experience.

5) Explain that the purpose of the course is to improve trainees' abilities actually to manage their socíeties more effectively, and not merely to repeat theories or principles without putting them into practice. Explain the main features of the "Action Commitment" which is included in this programme:

- Before the end of the programme each trainee is expected to have identified at least one major problem, related to cost accounting and control, which they are going to solve on their return home.
- During the final course day (Session 5.2) everyone will work out, in consultation with fellow trainees, detailed "action plans" to which trainees will commit themselves for solving the problems.

Tell trainees that the instructor intends to contact them at a later date in order to assess how successful they have been in implementing their plans. The course, rather than they themselves, will be evaluated by their success.

6) Ensure that any administrative problems are dealt with. Matters of accommodation, payment of expenses, transport, rooms for private study and any other points of information should be settled now.

SESSION 1.2

WHY ARE COST ACCOUNTS NECESSARY?

Objective: To enable trainees to explain why it is necessary to know the costs of products and processes, even if selling prices are beyond their control.

Time: 1 1/2 to 2 hours.

Material: Mícro cases "Cost Information Needs".

Session Guide:

1) Write the following simplified statement of operations for an agricultural marketing co-operative on the chalkboard/OHP:

Sales 1,000 tons @ $100		100,000
Cost of Produce 1,000 tons @ $70		70,000
Gross Margin		30,000
Expenses:		
Wages	10,000	
Salaries	3,000	
Committee expenses	500	
Rent	1,500	
Transport Hire Charges	4,000	
Miscellaneous Expenses	1,000	
Total Expenses		20,000
Surplus		10,000

Ask trainees to imagine that these figures summarise one year's operations of a co-operative society whose only function is to buy, process and sell a crop. What is the cost per ton of dealing with members' crops?

* OHP = overhead projector

Elicit the answer $20,000 divided by 1,000 equals $20. Ask trainees whether there is any need for further information about the costs. Suggest that a statement of the societi¢s total costs, as contained in the annual accounts, is all that is needed to calculate costs. Annual accounts show the annual costs as well as the revenue. Why should there be any more "cost accounts" than this?

2) Ask trainees to suggest circumstances when ít may be necessary to have more detailed cost information than is supplied in the accounts as normally provided for financial purposes. Elicit suggestions such as the following:

- To enable management to decide whether or not to make changes in the methods presently used.
- To enable management to explain to members how therr money is spent.
- To direct management's attention to the most expensive ítems so that they may attempt to reduce costs.
- To estímate the possible effects of changes in the amount of produce handled.
- To assess whether or not the society can afford increases demanded by suppliers or employees.
- To allocate responsibility for cost control to those responsible for each operation.
- To set prices.
- To prepare budgets.

Ask trainees whether they are free to determine the prices charged by therr societies, or the prices paid for members' produce or for farm inputs. Most if not all the sales of many societies are at controlled prices. Trainees may feel that the only purpose of knowing costs is to set prices, and they need not concern themselves with cost accounting if they are not free to decide on prices.

Stress that there are many other uses for cost information which will be dealt in subsequent sessions.

3) Distribute the cost information micro cases. Allow trainees up to 20 minutes to study them, and to list the information that they would require in each case.

4) Ask one trainee to read out one item of information needed for the Argus Society. Summarise this on the chalkboard/OHP, and ask a second trainee to make a further suggestion. Continue round the group; avoid repetition, but ensure that all sensible and relevant suggestions are listed. These should include:

Argus Society

- Operating costs of this particular vehicle, separated from the remainder.
- Fuel and maintenance costs appropriately classified.
- The trend of fuel and maintenance costs in order to indicate likely future levels.
- Some assessment of the cost effects of breakdowns.

  The likely future life of the present vehicle.
- The payment system offered for the new vehicle.
- The written down value of old vehicles and the comparative operational costs.

If trainees suggest information which might be useful but which appears of minor relevance, or impossible to obtain, ensure that trainees understand the reasons for omitting the item by asking:

- How would the information be obtained?
- What would it cost to obtain it?
- What difference would it make to the decision whether or not the vehicle is purchased if the answer to this question was X or Y (mentioning two possible extremes)?

Ask trainees if this type of information, in this detail and up-to-date, is available in their societies. If not, and if they had to make a similar decision, how confident would they be that their decision was correct?

5) Follow the same procedure for each of the four remaining studies. The information required should include the following in each case:

Belisha Society

- Past records of product costs at various levels of activity, in order to forecast costs, and the surplus, at the new increased level.
- Costs of individual items, such as wages and supplies, which might be expected to increase with the higher level of operations which is forecast.

Cicada Society

- Figures comparing the transport costs and the amount of work done by the transport department in recent periods.
- Calculations of the movement in costs which are caused by changes in the volume carried, and those caused by changes in efficiency.

Derry Society

- Figures for the society's costs of carrying out the tasks which, it is suggested, should be carried out by the new data processing centre.
- An assessment of what would be saved if the society ceased to carry out the tasks itself.

6) Ask trainees whether their societies could readily make available the kind of information which they have suggested is needed for each of these cases.

Few if any are likely to be able to do this.

Ask trainees whether their societies produce regular accounts, showing not only the total of money spent and received, but also on what it has been spent, or for what it is received. All societies do this, if only to satisfy the legal requirements.

Ask why such figures are usually not sufficient for the kind of task required in these case studies. Stress that figures are often delayed for months or even years, ask why this is so.

Trainees will refer to pressure of work and other similar excuses. Stress that they really mean that accounts are given low priority by managers, because they are no use to managers, and are only produced to satisfy the regulations. The same basic information that is used to prepare annual accounts can be used to give answers to the kinds of questions in the cases. Usually the only changes that are needed are:

- the information must be produced more quickly,
- the information may have to be classified differently,
- the information must be presented differently (and usually far more clearly),
- the information must be provided to, and used by, different people.

Stress that the objective of the following sessions is to enable trainees to obtain and use this type of information. The aim is not to produce neat looking records to satisfy inspectors, but to produce a tool for effective management.

Cost Information Needs

Read through the following short cases; for each one, list the information that the co-operative society will need in order to make a decision.

(a) The Argus Society has a fleet of four vehicles, and has had satisfactory service from its five-ton general purpose truck. The vehicle is now five years old, however, and the local dealer has proposed a part-exchange for one of the latest models of the same capacity. He has stressed the lower fuel use, modest maintenance requirements and improved driver comfort of the new vehicle, and the manager of the society must decide whether or not to recommend exchanging the old vehicle for a new one.

(b) The members of the Belisha Society have overwhelmingly agreed to grow the new hybrid crop next year, and they are confidently expected to increase yields by about 25%. The society should be able to transport, process and market the increased production without any major change in its facilities. It will, however, be necessary to construct a new building, because the existing rented premises will no longer be available. The Co-operative Bank has requested an estimate of the society's surplus next year as a basis for a decision on the loan application that has been submitted by the society to construct the new building.

(c) The transport supervisor of the Cicada Society is under pressure from the management and committee to be more efficient. He complained that it is impossible to run the vehicles as efficiently as in previous years, because members are selling less of their crops to the society. The committee complains that he is not managing the transport service properly. The supervisor complains about members' disloyalty, but nobody actually does anything to improve the situation.

(d) The co-operative union has recently set up a data processing unit, which is offering to take over payroll, sales and purchase accounting function of the primary societies, for a regular monthly fee based on turnover. It is said that the new system will be more efficient than societies' present arrangements. In the Derry

Society these tasks are presently carried out by the clerical staff and the assistant manager, among their other duties. The society is under some pressure from the co-operative union to subscribe to the new service, but they want to be sure that they are making the right decision since they are free to do as they wish.

topic

2

cost behaviour

SESSION 2.1

COSTS AND VOLUME

Objective: To enable trainees to identify the relationships between costs and the volume of activity.

Material: 12 to 2 hours.

Session Guide:

1) Allow trainees up to ten minutes to write down as many different regular cost items as they can for a typical agricultural co-operative society in their country. (In this session guide, costs for a society which collects, stores, transports and sells its members' crops are included; the items will of course be different for a society involved in processing, input supply or other functions and should be modified accordingly.)

2) Ask one trainee to make a suggestion, write this on the chalkboard/OHP and ask another trainee for a further item. Go round the group eliciting different items, and list them at random. Do not at this stage suggest the reason for making up this collection of cost items.

If trainees mention items such as the cost of vehicles or machinery and equipment, remind them that you asked for regular expenses. Ask how the costs of "capital" items, or occasional large purchases of this sort are accounted for, and if necessary introduce the concept of depreciation.

The list might read as follows:

(The numbers and stars should not be included at this stage)

Postage	13	Stationery	12
Vehicle maintenance	21	Crop payments to members	* 24
Building repairs	15	Packing material	* 23
Cleaning materials	16	Audit feet	1
Office equipment depreciation	9	Electricity	* 17
Manager's travel expenses	18	Vehicle licenses	2

Labourers' wages	20	Entertainment	11
Rent	19	Management salaries	7
Vehicle fuel	* 22	General meeting expenses	4
Clerical staff wages	6	Vehicle depreciation	10
Vehicle insurance	3	Committee members' meeting fees	5
Furniture depreciation	8	General insurance	14

3) Go through the list on the chalkboard, putting a star against all those so marked on the above list.

Ask trainees to suggest why these particular items have been marked with a star. Ask for suggestions from a number of trainees. If nobody suggests that the starred items are those which vary most directly with the volume of crops processed, elicit this answer by asking trainees to compare the likely movement of one of the starred items with one of the others, such as audit fees, if crop purchases double.

4) Ask trainees why it is necessary to distinguish between costs which are fixed and those which vary according to the level of activity. If necessary, ask trainees whether the following estimate for Month 2, based on data from Month 1, is likely to be correct.

Month 1:

Crop processed = 100 tons Total costs = $1,000
Processing cost per ton = $10

Month 2:

Crop processed = 200 tons Total costs = $2,000
Processing cost per ton = $10 (as before)

Trainees should realise that this is most unlikely to be correct.

Ask trainees to calculate the total cost and cost per ton of processing 200 tons given the following information:

At 100 tons, fixed costs = $400
variable costs = $600

Elicit the answer:

At 200 tons, fixed costs remain $
variable costs = $ 1,200
total costs = $ 1,600

Processing costs per ton = $ 8.

Stress that we are only concerned here with the movements of costs which are caused by changes in the level of activity. Inflation, wage increases and other factors can of course cause other changes.

5) Ensure that all trainees grasp the effect of fixed and variable costs on cost per item. Check their understanding with the following exercise, which should be presented on the chalkboard or OHP:

Typing Costs:

Typewriter, salary, accommodation etc. $10 per day.

Paper, ribbon, maintenance 10c per letter.

Typist A types 10 letters per day.

Typist B types 20 letters per day.

What are the costs per letter for typist A and B?

Trainees should be able to calculate the answer very quickly.

	Variable	Fixed	Output	Cost per Letter
Typist A	10c	$10	10	$1.10
Typist B	10c	$10	20	60c

If any trainees are still unclear, ask them to calculate costs for other rates of production, or other similar situations, until you are sure that everyone understands.

6) Refer back to the list already on the chalkboard, prepared under Item 2 above. Ask trainees to comment on the choice of items which have and have not been starred. Do they agree that the unmarked items are completely fixed, regardless of activity?

Elicit discussion on items such as: Vehicle maintenance,
Labourers' wages,
Postage,
Building repairs.

Show that these are by no means fixed, they may not vary directly according to the total amount of crops processed, but they are affected by higher levels of activity:

- Vehicles need more frequent repairs.
- Extra casual labour or over-time may need to be paid for.
- Wear and tear on buildings is increased.
- More correspondence is needed to market more produce.

7) Refer trainees to the starred items. Are all of them totally variable, so that they will increase or decrease exactly in proportion to the amount of produce handled?

Ask trainees to comment on the likely movement of items such as:

Vehicle fuel
Packing material

Why might these <u>not</u> double if the volume of crops doubles?

Elicit suggestions such as:

- Larger volumes may mean that vehicles will be more often loaded to capacity, therefore reducing mileage per ton.
- Higher consumption may mean that the society can obtain volume discounts for fuel or packing material.
- Some journeys are made for administrative or personal reasons, and the same number of such trips will be made however much crop is handled.

8) Stress that costs cannot neatly be divided into fixed and variable, as in the earlier over-simplified example, or as described in some management textbooks.

Allow trainees up to 20 minutes to copy down the list from the chalkboard, ranking all the items in their order of variability. They should rank the most fixed as number one, and the most directly variable as number twenty-four. Stress that the exact sequence is not very important, and some may be more or less equal. The aim is for trainees to think carefully about how the various different cost items are likely to change when the volume of business changes.

If any trainees have difficulty in understanding what is required, ask for suggestions as to number one and number twenty-four. Possible answers might be:

1 = Audit fees
24 = Crop payment to members

Trainees should rank the remaining items from two to twenty-three.

9) When they have finished, ask one trainee to read out his rankings. A possible suggestion is included in the list of items in (2) above.

Ask other trainees for alternative rankings. Stress again that the exact ranking of individual items is of little importance. What is important is to recognise that no cost items are totally fixed or totally variable.

- Audit fees are likely to increase if the society doubles or quadruples its scale of activity.
- Crop prices may fall if members double or quadruple their production, because the crop may not be saleable.

Ask how a manager can estimate how each cost will behave if activity increases or decreases:

- He can examine records of past performance.
- He can make intelligent estimates.

Ask trainees to compare postage costs with fuel costs. How might a manager estimate the likely effect of increased activity on these?

- Fuel costs: Approximate calculation of extra mileage required.
- Postage: Probably not worth considering in isolation, because the cost is so small. It may be treated as fixed, or arbitrarily increased if more exact information is required.

10) Remind trainees of the micro cases used in Session 1.2. Managers frequently have to estimate how costs are likely to behave when volume changes:

- They may need to estimate future results or to set budgets.
- They may need to judge past results and to identify costs which are or are not out of line.

There is no purpose in wasting time on relatively insignificant items, or in attempting to estimate future costs to an unrealistic degree of accuracy. Stress that any estimates, budgets or other attempts at forecasting are only <u>tools</u> for managers, they should not waste time preparing them if nobody is going to make use of them in a way which will make a practical and valuable improvement to the management of their co-operative.

Ensure that all trainees understand the fundamental distinction between costs which are generally fixed and those which vary. Managers who appreciate this will be able to improve their results without increasing prices, because they will understand how <u>increased volume</u> reduces cost <u>per item</u>.

SESSION 2.2

THE MOVEMENT OF COSTS AND THE BREAK-EVEN POINT

Objective: To enable trainees to assess the variability of costs from past performance, and to estimate future performance by calculating the break-even point.

Time: 2 to 3 hours.

Material: Case study "The Valda Society" - Part I.

Session Guide:

1) Remind trainees of the previous session, stress that it is vital to appreciate the difference between fixed and variable costs, but that no costs are completely fixed or completely variable.

Write the following table of figures on the chalkboard/OHP:

Grain	=	10 cents per kilogram
Transport hire	=	$100 per 10,000 kilograms
Storage rental	=	$1,000 per 100,000 kilograms

This is a highly simplified cost schedule for an agricultural co-operative. Ask trainees to suggest why the cost of purchasing grain varies by each kilogram, whereas rental for storage varies only by every 100,000 kilograms:

- The money paid for grain rises with each kilogram purchased.
- It is impossible to rent part of a store, it is only necessary to rent additional storage when one store is full. The same applies to truck loading, it may be impossible to rent only part of a truckload.

2) Write a table in the following form on the chalkboard/OHP, filling in only the left hand column at this stage:

Amount of Crop	Cost of Crop	Cost of Transport	Cost of Rent	Total Cost
1 kilogram	10 cents	$ 100	$ 1,000	$ 1,100.10
100 "	10	100	1,000	1,110
9,000 "	900	100	1,000	2,000
10,000 "	1,000	100	1,000	1,100
11,000 "	1,100	200	1,000	2,300
90,000 "	9,000	900	1,000	10,900
100,000 "	10,000	1,000	1,000	12,000
110,000 "	11,000	1,100	2,000	14,100
190,000 "	19,000	1,900	2,000	22,900
200,000 "	20,000	2,000	2,000	24,000
210,000 "	21,000	2,100	3,000	26,100

Ask trainees to copy the table, and to fill in the answers for the one kilogram row. Ensure that they all understand that transport and rent cannot fall below the minimum figures of $100 and $1,000 respectively. If any activity is to take place, a complete truck journey must be paid for and one store must be rented.

Ask trainees to fill in the remaining rows, ensure that they appreciate the location of the points when a further truckload, or a second store,are needed.

3) Ask trainees to calculate the approximate cost per ton (1,000 kilograms) of transport and rent at the following quantities:

10,000 kilograms
11,000 "
100,000 "
110,000 "
200,000 "
210,000 "

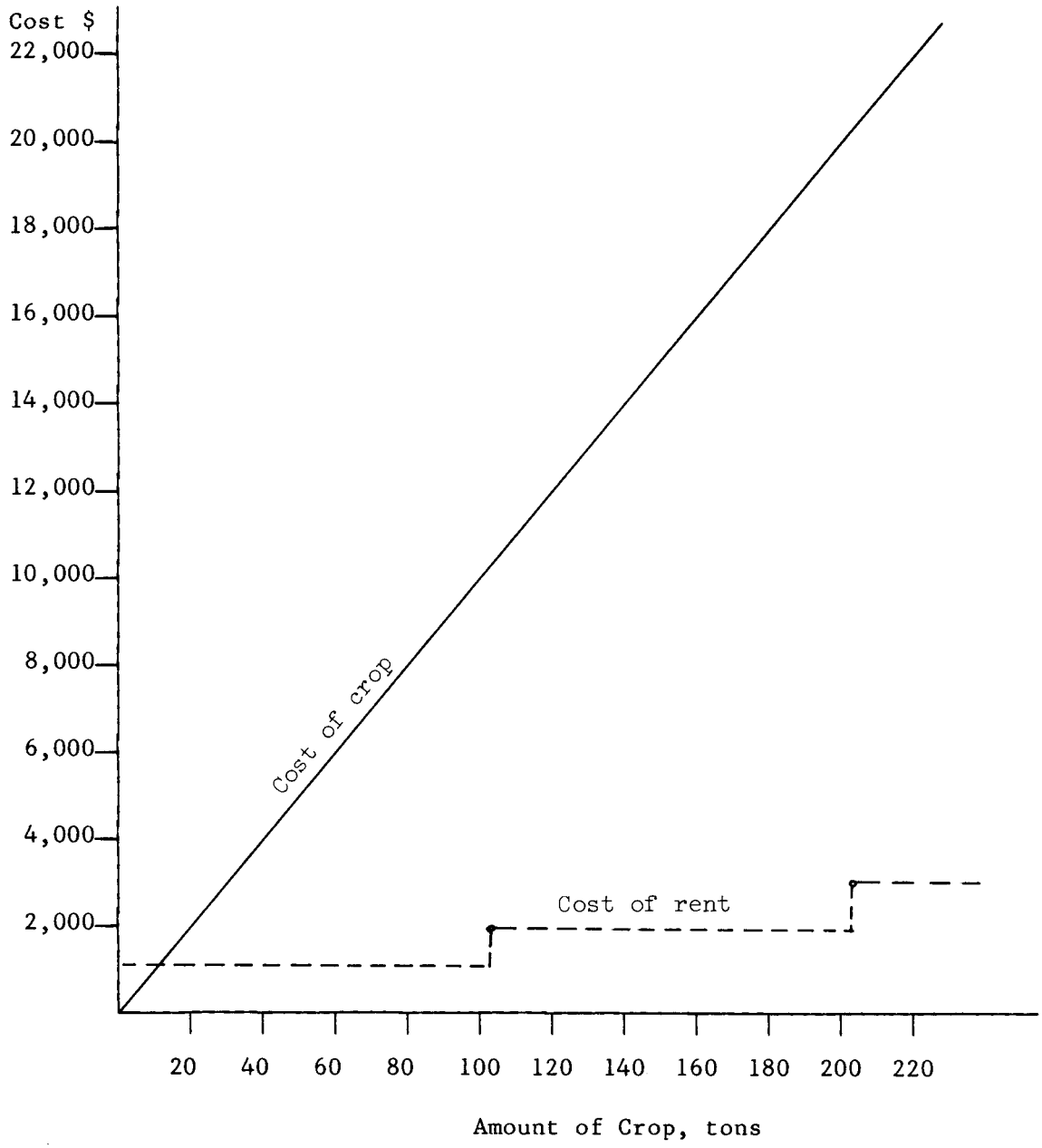
Write their answers on the chalkboard as follows:

Tonnage	Transport Cost per ton	Storage per ton
10,000 kilograms	$ 10	$ 100
11,000	18.20	90.90
100,000	10	10
110,000	10	18.20
200,000	10	10
210,000	10	14.30

Stress that these figures demonstrate that:

- No costs are indefinitely fixed but only within a certain range of activity.
- Unplanned expansion can increase costs per ton if it leads to a need for new facilities which cannot be used to capacity. Larger scale is not necessarily more profitable.

4) If trainees are familiar with graphs, ask them to draw a graph showing the cost of crops and of rent from the cost schedule. The graph should be in the form shown overleaf.



Stress that very few costs can be illustrated by a straight line, nearly all involve "steps", and managers must attempt to establish at what point the steps will be reached.

5) Distribute the case study. Allow trainees up to 15 minutes to read it through individually, answer any questions they may have, and then divide trainees into groups and allow them up to 45 minutes to solve the problem.

6) Reconvene the trainees, and ask one group for its suggestion. Write their figure on the chalkboard, and ask other groups for their answers. Write these down as well, and ask groups to ex-

plain how they reached their figures. If answers differ significantly from one another, ask representatives of each group to explain how they reached their answer.

The answer may be calculated in a number of different ways:

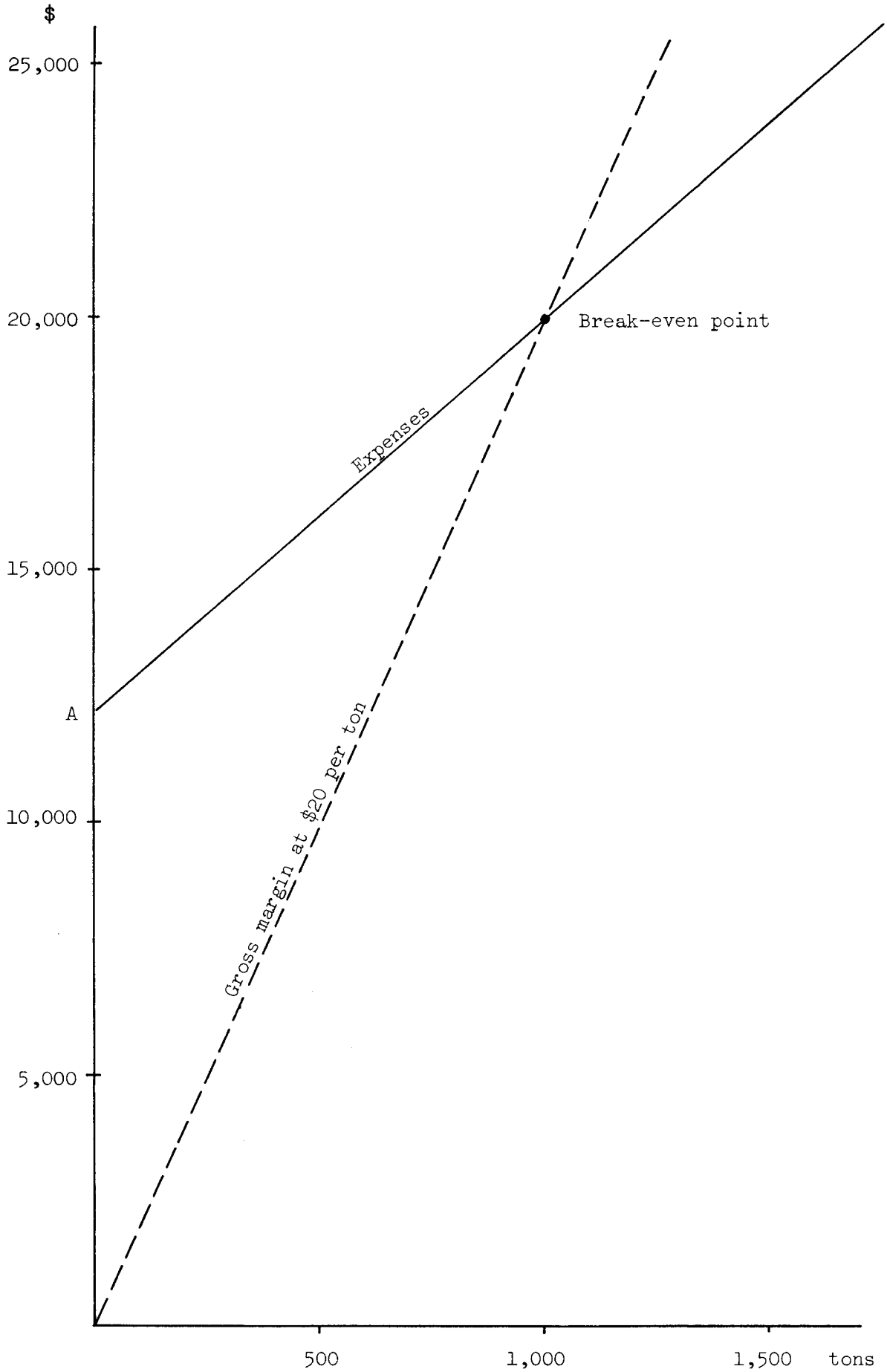
- The loss at 800 tons (1980) and the profit at 1,200 tons (1984) are very similar; a figure of 1,000 tons should approximately produce a "break-even" result, with no loss or profit.
- A graph may be drawn, as shown overleaf. Explain that one of the lines shows the costs, excluding the cost of grain, and the other line the gross margin which is at a constant $20 per ton, as the selling and buying prices per ton do not vary.

Ask trainees why the two lines on the graph cross, why are they not parallel? Stress that point "A" on the graph represents the fixed costs, which are likely to continue even though the society is not marketing much produce. As long as there is some business there are certain minimum costs. This means that on the graph the two lines are not parallel, because the cost-line never goes to zero.

Trainees may be familiar with the concept of a break-even point, where costs are the same as revenues. They should appreciate that what they have done in this exercise is to calculate a break-even point for the society.

With the help of the graph, the gross margin at various tonnage levels ($20 per ton) may be compared with the total cost. The point where the costs equal the gross margin, i.e. the point where the two lines cross, is the break-even point.

Stress that a very exact answer should not be calculated, since the costs cannot accurately be forecast. Members might blame the manager if he gives a very precise figure and other costs then rise, so that even if the target is achieved the society makes a loss.


$
25,000
20,000
15,000
A
10,000
5,000
Break-even point
Expenses
Gross margin at $20 per ton
500
1,000
1,500
tons

7) Ask trainees to examine the movement of the various cost items, as compared with the variation in tonnage, in more detail. Ask them to suggest how it appears that the costs are related to the tonnage.

Elicit the following suggestions:

- Cost (and sales) of maize: Varies directly with tonnage.
- Transport hire: There appears to be a minimum figure of $5,000 plus $5 per ton for any tonnage over 500 tons.
- Bags: $1 per ton.
- Rent: Fixed at $1,000.
- Labourers' wages: There appears to be a minimum figure of $2,500, which increases by $1 per ton for any tonnage over 700 tons.
- Salaries: Fixed at $5,000.
- Treatment: $2,000 minimum plus $1 per ton for any tonnage over 800 tons.
- Stationery, postage and meeting expenses: Fixed total of $500.

8) Elicit from trainees, particularly any with relatively recent secondary or even primary school mathematics, suggestions as to how these relationships can be used to calculate the answer more exactly than in the ways already suggested.

A simple equation can be put together, based on the following formula:

If X = the tonnage,

Gross margin	=	20X
Transport costs	=	5,000 + 5 (X-500)
Bags	=	1X
Rent	=	1,000
Labour wages	=	2,500 + (X-700)
Salaries	=	5,000

Treatment	=	2,000 + (X-800)
Stationery, postage and meeting expenses	=	500

The point at which the gross margin will equal the costs is the break-even tonnage and may be calculated as follows:

Gross margin	=	Total costs
Gross margin	=	Transport costs + bags + rent + wages + salaries + crop treatment + stationery, postage, meeting expenses.
20X	=	5,000 + 5 (X-500) + X + 1,000 + 2,500 + (X-700) + 5,000 + 2,000 + (X-800) + 500
20X	=	5,000 + 5X - 2,500 + X + 1,000 + 2,500 + X - 700 + 5,000 + 2,000 + X - 800 + 500
20X	=	12,000 + 8X
20X - 8X	=	12,000
12X	=	12,000
X	=	1,000 tons

This is the most accurate calculation, but remind trainees that mathematical accuracy should not be allowed to delude members, or the manager, into believing that any form of agricultural activity can be forecast with complete accuracy.

The Valda Society - Part I

The manager knew that the next season would be "make or break" for the Valda Farmers' Society. The society had lost money for the last three years. It had been formed five years ago, but after two years of reasonably good results the previous manager had been caught falsifying members' payments. He was dismissed, but members lost faith in the society and sold most of their crops elsewhere. The facilities were under-used, and although the new manager had tried to reduce costs there was little he could do to avoid the immediate losses.

By hard work and efficient performance he managed to regain some members' loyalty, and improved the results somewhat, but the society still lost money. This year, however, things had got to be different. The Co-operative Department had undertaken a new policy of "Get Up or Get out"; any society which by the end of next year could not show at least one year with a surplus out of the last three years would be wound up and merged with another more successful unit.

Many of the local people had reacted strongly when this threat became known. Although they had not supported their society in recent years, they were very reluctant to allow it to pass out of their control or be closed altogether. A number of members who had had no dealings with the society for some years met with the committee, and they told the manager that they were prepared to make a major effort to persuade as many people as possible to give the society another chance.

They needed to have a target to work towards, however; how many tons of maize would members have to sell through the society in the coming season in order for it to avoid losses?

The manager had prepared a summary of the last five years' results for the society. There had been some general inflation during this period, but he had corrected all the figures in order to eliminate the effects of price increases. Now he had to analyse the results and work out what level of tonnage would eliminate the lossess.

Results of The Valda Society

Item	1980	1981	1982	1983	1984
Tons marketed	1,200	1,400	500	700	800
Cost of maize @ $40 a ton	$ 48,000	$ 56,000	$ 20,000	$ 28,000	$ 32,000
Transport hire	$ 8,500	$ 9,500	$ 5,000	$ 6,000	$ 6,500
Cost of bags	1,200	1,400	500	700	800
Rent	1,000	1,000	1,000	1,000	1,000
Labourers' wages	3,000	3,200	2,500	2,500	2,600
Management salaries	5,000	5,000	5,000	5,000	5,000
Crop treatment	2,400	2,600	2,000	2,000	2,000
Printing and stationery	200	200	200	200	200
Postage	100	100	100	100	100
Meeting expenses	200	200	200	200	200
Total costs	$ 21,600	$ 23,200	$ 16,500	$ 17,700	$ 18,400
Sales at $60 a ton	$ 72,000	$ 84,000	$ 30,000	$ 42,000	$ 48,000
Total costs including produce	69,600	79,200	36,500	45,700	50,400
Surplus/(Loss)	$ 2,400	$ 4,800	$(6,500)	$(3,700)	$(2,400)

Assignment:

How many tons of maize will the sellers have to market in order to achieve "break-even"; that is, no surplus and no loss, in 1985?

SESSION 2.3

DIRECT COSTS AND OVERHEADS

Objective: To enable trainees to distinguish between direct and indirect, or "overhead" costs, and to identify the issues involved in allocating them to different activities.

Time: 1½ to 2 hours.

Material: "The Valda Society", Part I (from Session 2.2).
"The Valda Society", Part II: Role Briefs.

Session Guide:

1) Remind trainees of the previous session, and of the difference between fixed and variable costs.

Ask them to consider their own cost, that of management; how do they decide how much of their own salary and support costs should be allocated to each activity?

Trainees may never have thought about this before; show that it is sometimes necessary to allocate costs in this way, in order to set prices, for instance. This session will bring out the issues involved in this type of decision.

2) Divide trainees into three groups, one to represent each side in the argument described in The Valda Society, Part II, and one to act as managers or arbitrators.

Distribute a copy of Role Brief A to all members of one group, Role Brief B to members of the second group and Role Brief C to those who are acting as the arbitrators. Ensure that all trainees have copies of the case study from Session 2.2 and that they have some notes of the conclusions about the break-even point and the explanation for the movement of various cost items.

Ensure that members of each group do not see the briefs of any others. Allow the groups up to 20 minutes to discuss the position

they will present and the arguments they will use, and, in the case of the arbitrators, the criteria they will use in judging the conflicting points of view.

3) Reconvene the class, and ask a spokesman for Group A to present their case. He or she should be followed by a representative of Group B. A spokesman for the arbitrators should then be allowed to ask any questions of the two groups. Thereafter the debate can be open to any trainees who wish to make a contribution. Ensure that members of Groups A and B do not "change sides" at this stage, they should attempt as effectively as possible to put forward the case they were asked to represent.

Trainees should be discouraged from extending the discussion too far beyond the basic pricing issue. If the two groups succeed in achieving an amicable solution without the help of the arbitration, the third group should be asked to comment on the debate and its conclusion, and not necessarily to put forward their own "verdict" instead.

After a debate of around 30 minutes, ask the arbitrators to withdraw for five minutes in order to make their decision, they should then return and present their conclusion, along with their reasons.

4) The arguments for each side should include the following; if any major points are omitted, ensure that they are introduced and understood.

<u>$45 Price</u>:

- The society will not be spending any extra money on transport, rent, storage or management, and there is no reason why members should pay for expenses that have not been incurred.
- If the society tries to earn a substantial surplus on the fertilizer sales, it will mean that those members using fertilizer will be subsidising the whole operation; this is not fair.
- A low price will encourage more fertilizer use and thus higher production in future. Everybody will benefit from this, be-

cause processing and storage costs will be spread over a larger volume.

- The society exists to serve its members, not to exploit them. The good fortune of being able to use the existing transport and storage, without any additional costs, should be passed over to members and not retained by the society.

$60 Price:

- Revenue from the additional activity should be used to reduce the cost of transport, labour, management and storage per ton of maize. There is no reason why the fertilizer should not carry its fair share of the cost.
- Using the formula which was developed during the previous session, it is possible to calculate the cost per ton of transport and other services, assuming that the target figure of 1,000 tons of maize will be achieved, and that 100 additional tons of fertilizer will be handled, making 1,100 tons in all.

Transport	$5,000 + 5 (1,100 - 500) = $8,000		=	$ 7.27 per ton
Rent	$1,000		=	.91 per ton
Labour	$2,500 + (1,100 - 700)	= $2,900	=	$ 2.63 per ton
Salaries	$5,000		=	$ 4.54 per ton
Postage etc.	$500		=	.45 per ton
		Total cost	=	$15.80 per ton

This works out at $45 + $15.80 or $60.80 per ton; $60 may be too low a price!

- The 100 tons of fertilizer should bear their due share of all the costs, as calculated above. An additional argument for this is that members may require more fertilizer or other inputs in the future, at different times when they cannot use the transport and other services. Every additional supply should bear its proper share of all the costs, since some additions in the future will undoubtedly incur extra costs. It would be a dangerous precedent to add no margin to the fertilizer cost in this case.

- If the society charges $60 a ton, there will be an additional surplus of $1,500 or about $1.50 per ton of maize. The fertilizer operation will only be able to take place because of the main operation of maize marketing, and those members buying fertilizer should therefore pay for the service. They will benefit, like all the other members, from the additional surplus.

5) Both sides clearly have good arguments. The arbitrators may reasonably propose a compromise, possibly along the following lines:

- Total transport costs increase by $5 for each additional ton. The fertilizer should therefore carry a $5 per ton transport cost.
- Labour wages increase by $1 per ton, so the fertilizer should only bear this cost for labour.
- The fertilizer operation will bring the total tonnage of maize and fertilizer to 1,100 tons. The total cost of management, rent and other services is $5,000 + $1,000 + $500 = $6,500, that is $5.90 per ton.
- The total "burden" to be carried by the fertilizer should therefore be:

Transport	$ 5.00
Labour	1.00
Management and Overheads	5.90
Total	$ 11.90

The fertilizer should therefore be sold for $56.90 per ton, or possibly $55 in order to encourage greater use and thus contribute towards greater production by members and better results for the society as a whole in the future.

6) Ask any trainee with a knowledge of accounts to say what "Overhead Expenses" are. Elicit the answer that overheads are expenses which have to be incurred by a society, but which cannot be clearly identified with any particular activity. An alternative terminology is "direct costs" for costs that can be identified with specific activities, and "indirect costs" for overheads.

Check trainees' understanding by asking them to identify the overheads in the Valda Society case study; elicit items such as rent, salaries, postage, etc.

Refer back to Sessions 2.1 and 2.2; ask trainees to suggest the differences between fixed and variable costs, and direct and overhead costs.

Stress that direct costs need not be variable. If the Valda Society had to rent a store especially for the fertilizer, it would be a fixed cost but would also be directly related to the fertilizer.

7) Ask trainees to give examples of overheads in their own societies. Stress that control of overheads is often over-looked, since major attention is directed at major direct items such as produce selling prices or transport costs. Further sessions will examine how and when overheads should be allocated to activities, and how they can be controlled.

Ask trainees to suggest what proportion of their societies' costs are overheads. Figures will differ, but overheads often amount to between 1/3 and 1/2 of total costs.

The Valda Society, Part II

Role Brief A

You are a member of the Valda Farmers' Society, and you have been persuaded to support the society this season, in view of the threat to its future. A few weeks ago the manager told the members that the society was going to be able to supply fertilizer this year, in addition to marketing your crop. You were very pleased to hear this, since the privately owned distributors from whom you presently buy fertilizer are inefficient and you think that their price of $60 a ton is extortionate.

The manager said that it was going to be possible to transport and store the fertilizer without incurring any additional expenses, since the same vehicle that delivers maize to the Marketing Board store will be able to collect the fertilizer from the National Fertilizer Corporation depot, and bring it back on what would otherwise be an empty journey. The fertilizer will be stored for a few weeks in the society's warehouse, which will by that time be empty, and you will then be able to collect your 40 bags of 50 kilograms each when you need them.

The manager said nothing about the price, but you know that the National Fertilizer Corporation charges $45 per ton for fertilizer collected in minimum lots of 50 tons from their depot. Since no additional expense is going to be incurred by the society, you assume that you would have to pay the same amount, which will certainly be an improvement on the $60 price you are paying right now.

You have recently heard rumours that the society will be charging a far higher price. You are not sure how much is being suggested, but you cannot understand why you should pay any more than $45, since that is all that it is going to cost the society. In order to make sure that you do not end up paying any more than $45, this year or in any future year when you expect to use far more fertilizer, you and a group of like-minded members are going to see the manager. You propose to present your case for a $45 per ton price as forcefully as possible.

The Valda Society, Part II

Role Brief B

You are a member of the Valda Farmers' Society. You live in a hilly area and you grow traditional maize, but your yields are quite satisfactory given the difficult conditions, and you have agreed to support the society in order to avoid the threat of closure.

A few weeks ago you heard that the society was going to start supplying fertilizer. You do not use fertilizer yourself, since it is uneconomic with traditional maize, but you were glad to hear of anything which could help the society to earn more money.

Apparently they will be using the same truck that takes the society's maize to the Marketing Board store to collect the fertilizer from the nearby National Fertilizer Corporation depot and bring it back to the society's store. Members who need fertilizer will then collect it from the store themselves.

Fertilizer normally costs around $60 a ton. You have heard that the society will be paying $45 a ton for the fertilizer collected in bulk from the depot. Those members who use fertilizer have apparently ordered a total of 100 tons, and you realise that the margin of $15 per ton will add about $1,500 to the society's surplus. You know that this will be a great help, and may even enable you to receive a dividend for the first time.

You have recently heard, however, that some of the members who will be using fertilizer think that they will only have to pay $45 a ton for it. You cannot understand where they have got this idea, since everyone realises that it costs money to transport and store their maize, and to manage the whole operation. Fertilizer will be no different, except that it will be moving in the other direction from the crop.

You, and a number of your neighbours who do not plan to use fertilizer, are very worried about the rumours of cheap fertilizer. You realise that the expenses involved will have to be paid for out of the surplus earned on your maize production. You have therefore decided to go to see the manager, and to explain to him why you feel the fertilizer

should be sold for $60, and that there will be no question of any lower price being considered. You believe that if the fertilizer sales cannot carry their proper share of the society's costs, the society might just as well not become involved in fertilizer distribution at all.

The Valda Society, Part II

Role Brief C

The members of the Valda Farmers' Society have responded well to the call for support for the society and there seems to be little doubt that the target deliveries of 1,000 tons of maize will be achieved. As manager, however, you are now worried by another problem which has arisen from your own success.

In your efforts to find additional business for the society you contacted the National Fertilizer Corporation. They were not satisfied with the present privately owned distributors in your area, and they agreed to allow the Valda Society to distribute fertilizer direct to its members. The members who use fertilizer will require it just a few weeks later than the time the society will be delivering members' crops to the Maize Marketing Board. The fertilizer depot is in the same town as the Marketing Board store, and it will therefore be possible for the fertilizer to be transported back to the Valda Society at no extra cost, since the truck would otherwise be making the journey empty.

You asked members to place orders for fertilizer well ahead of time. Only about half of them wish to use it, since the others still grow traditional varieties of maize on hilly areas where hybrid maize is not economic. Altogether the members who are interested have ordered about 100 tons of fertilizer. There is clearly going to be no problem about transporting or storing this quantity. The price of fertilizer collected in bulk from the depot is $45 per ton. The society is free to set whatever price it wishes for reselling the fertilizer to its members, and you have decided that $50 is a reasonable figure, slightly less than the price charged by privately owned distributors of around $60. The extra surplus of $5 a ton of $500 in total will be a useful addition to the society's earnings in this critical year.

Now you have heard that a severe dispute had arisen over the price to be charged. Contrary rumours have been circulating, and this has apparently created a great deal of ill-will, and a delegation from each of the two opposing factions is coming to see you shortly to present their views and argue their case. You realise that the dispute could have severe effects on the society, whose future is by no means certain in

any case. You have got to listen carefully to what the delegations have to say, and then come to a conclusion which satisfies everybody.

Your conclusion should possibly take account of the fact that some costs for transport and labour are indeed variable, while others are fixed. It may be reasonable for the fertilizer to bear the variable costs, together with some proportion of the fixed costs.

topic

3

allocation of costs

SESSION 3.1

OVERHEAD APPORTIONMENT

Objective: To enable trainees to select appropriate methods of apportioning overhead costs to different activities.

Time: 12 to 2 hours.

Material: Case study "The New Delta Warehouse".

Session Guide:

1) Refer back to the previous session. Remind trainees that this dealt with the decision as to how overheads should be allocated, which departments or products should "carry" which costs.

   Ask trainees what basis was used to allocate the transport cost to the fertilizer and to the maize; the respective tons carried of each was the obvious basis to use.

   Are there some tasks or products where allocation according to weight is impossible or inappropriate? Refer back to previous exercises on calculating costs of letters written or other similar tasks, to show that other methods must sometimes be found. Managers must decide:

   - To what tasks, departments or products overheads must be allocated.
   - What proportion of each overhead must be allocated to each task, department or product, that is, how must they be apportioned.

   Distribute the case study. Divide trainees into groups and allow them up to 30 minutes to come to a decision and to prepare a presentation, justifying the method of apportioning overhead costs which they prefer.

2) Reconvene the class, and ask each group in turn to present their conclusions.

If there is a difference of opinion, encourage discussion and argument. Attempt to elicit arguments against each view by asking trainees to suggest comments which might be made by the society's members who were buying the following supplies:

Against a, Apportion by Weight:

Cement (Heavy, low value, tends to be sold quickly but penalised drastically if charged on a weight basis.)

Against b, Apportion by Time:

Small hardware items such as nails. (They may be stocked for a long time, but they do not deteriorate and occupy little space.)

Against c, Apportion by Value:

Small quantities of concentrated chemicals. (They are very highly priced, but use little space, do not deteriorate and are easy to handle.)

Against d, Apportion by Cubic Volume:

Sacks, baled forage or wire netting. (Very high volume, but tie up little money, may only be stocked for a short time.)

Ensure that the arguments for and against all four suggestions are presented, even if they have not been put forward by any group.

3) Trainees may suggest some combination of two or more methods. Ask them to describe how any such figures would be worked out in practice. Stress that arguments such as those put forward in the case study often distract management from the task of cost control; it is easier to talk about new methods of accounting than actually to improve the efficiency of what is being done.

Ask trainees to suggest what factors they must consider, apart from fairness.

Elicit the fact that any system must be practical and easy to apply. There is no point in having a fair system if it involves staff in calculations and measurements which will cause overhead costs to be even higher.

Ask trainees to rank each of the four methods in terms of its simplicity; elicit some such ranking as:

Simplest	(1)	Value
	(2)	Weight
	(3)	Volume
Most Complex	(4)	Time

4) If the groups have not already come to this conclusion, stress that apportionment by value is probably the best solution:

- It is by far the easiest to apply, involving no extra collection of information since prices are already known.

- The cost of capital, insurance, security, buying and administrative time are in fact closely related to value. Factors like space or handling equipment are far less important.

Stress that it is unnecessary to go to excessive details in apportioning overheads such as storage costs, and that any system should be tested by asking whether the results make any difference to management decisions. If they do not, the simplest system should be preferred.

5) This session has dealt with only the apportionment of storage costs. Trainees whose societies are involved in processing, transport or other activities should be asked to consider how overheads might be allocated for these operations. They should suggest a method which fairly reflects the increased expense if use of the particular facility increases. Examples include:

- Transport, where extra weight is likely to lead to extra administration and vehicle overheads, and should therefore be used as the allocation measure.

- The overheads for processing activities should probably be apportioned on the basis of the time spent by the operators, since this is likely to increase if volume increases.

Stress that it is less important to apportion overhead costs than it is to make sure that overheads are kept at a minimum, and that all equipment is operated at full capacity so that the overheads are spread over as large a production as possible. Remind trainees of the previous session, where the apportionment method was less important than management being aware of the opportunity to use presently under-used warehousing and transport capacity.

The New Delta Warehouse

The Delta Farmers' Society had for many years operated a successful marketing operation: collecting, storing and selling its members' crops. They had now decided to provide a comprehensive agricultural input supply service to the growing membership.

In order to be sure that the service was a genuinely comprehensive and effective one from the very beginning, the society invested very heavily in new physical facilities. They constructed a specially designed warehouse, and leased a forklift truck so that their heavy stocks of fertilizers, seeds and other items could be properly stored and taken when needed.

The whole operation was to be managed by a newly appointed farm supply supervisor. He had already hired a driver for the forklift truck, a stock clerk, a sales clerk and two general labourers. The stock clerk had been sent on a course to learn how to operate the special stock control system that was going to be used, and the sales clerk was also being trained to operate the new electronic cash register which would itemize each sale and provide information for stock records.

A large variety of items were to be stocked. Fertilizers would take up the most space, the 50 kilogram bags would sell for between $10 and $20 each, depending on the variety and strength. There was also to be a large number of different types of seed, ranging from small envelopes for vegetables, selling for $1 or less, to 50 kilogram bags of maize seed, potatoes and wheat. These bags would sell for up to $50 each. There were also bottles, cans and drums of liquid fertilizers and other agricultural chemicals. Some were very concentrated and expensive even for a small quantity while others were relatively cheap. They were also planning to stock a range of commonly required hardware and tools, such as corrugated iron sheets, fencing wire, cement, sprayers, shovels, hoes and spades. These would occupy a fair amount of floor-space, but little special storage equipment would be required, and materials of this sort were often required by members and were sometimes difficult to acquire from other suppliers.

The society had had to spend a great deal of money on constructing the warehouse, but the manager had realised that more money would be tied up in the stock to be held in it. Some items, such as seeds, would only remain in stock for a few days or a week or two at the most, since members had to sow their seeds in as fresh a condition as possible and the society only took delivery very shortly before planting time. Other items, such as fertilizers, might be in stock for some months. Certain hardware items might be stocked for even longer, since it was difficult to forecast demand and there were attractive quantity discounts which made it worthwhile to buy rather large quantities. The society's bankers had agreed to a substantial overdraft, to be drawn on as required, but the manager realised that this was not necessarily economic; the interest to be paid was substantial.

The manager had tried to forecast the level of all the new costs that would be involved in the new farm supply operation. Members would collect their own supplies from the warehouse, or pay for delivery, and any credit they received would be separately paid for out of the society's credit scheme, but the cost of storage and administration would be substantial. The manager had budgeted a total annual figure of $50,000 for all the storage costs that could not be separately charged out to members. There was little doubt that these costs would be covered, because members would expect to pay a margin over and above the wholesale price of supplies to the society, but the problem now rose as to how the extra costs should be apportioned to the various items.

The manager had not dealt with this type of operation before, and he had asked four different people, who he judged had some experience in this field. Their responses were as follows:

Mr. A: "Forklift trucks, storage racks, labour, the basic structure of the building itself, all these depend on the weight of what is handled. Make an estimate of the total weight of goods to be handled in the year; if it is likely to be 5,000 tons, for instance, add $10 a ton to cover your expected expenditure of $50,000."

Mr. B: "It stands to reason, the longer an item is in storage, the more it costs. Things that move in and out cost hardly any-

thing, but what occupies the warehouse, ties up the overdraft, involves insurance, security and so on is goods that are stored for a long time. Divide things up into four or five categories from fastest to slowest moving items, and apportion the cost on that basis."

Mr. C: "Money is what counts. If something costs $10, it will cost ten times more to store than something that costs $1. Estimate the total value of what you plan to sell, and apportion the costs accordingly. If it is half a million dollars, for example, add on 10 cents for every dollar's worth, and that will give you the right apportionment."

Mr. D: "Storage, movement, space, these are what cause expenses and they are based on volume. Make a rough estimate of the total number of cubic metres of goods you will sell in a year, then measure each item, very roughly, apportion the $50,000 accordingly. If you reckon you will sell 10,000 cubic metres, for instance, then add on a $5 extra charge per cubic metre. A can of chemicals of about one-tenth of a cubic metre would bear a 50 cent charge."

Assignment

The manager now had to decide which method of apportioning the overhead costs to the various products he should use, and to present and justify his decision to the committee. Advise him on what he should do.

SESSION 3.2

COST CENTRES

Objective: To enable trainees to determine appropriate cost centres within their societies and to identify the appropriate ways of measuring their outputs.

Time: 12 to 2 hours.

Session Guide:

1) Ask trainees to suggest the main purposes of cost accounting, elicit the following:

- To set prices.
- To make decisions about future operations.
- To appraise past performance.

Write the following information about three societies, A, B and C, on the chalkboard/OHP. Allow trainees up to 15 minutes to list the kinds of information they might demand, for each society, for a cost accounting system:

Marketing Society A: Collecting, drying, storing and delivering its members' maize crop.

Transport Society B: Providing transport services to members.

Dairy Society C: Supplying cattle feed, processing members' milk and provision of artificial insemination services.

2) Ask trainees for their suggestions for Society A. These should include:

- The total costs of dealing with members' maize.
- The costs of the collecting, drying, storage and delivery operations, separately.

Society B:

- The costs of transport per journey and per ton.
- The cost of running each vehicle.

Society C:

- The cost of providing each service.

Point out to trainees that they are in effect suggesting that information about costs should be collected in more detail than just for the whole operation, in the case of each of the societies. They are proposing that information about costs should be collected for a number of different "centres", in order to achieve the objectives of costing which were mentioned in item 1.

List the following possible cost centres, for which costs might be separately collected. Ask trainees to suggest which are appropriate and which are not.

- a copying machine
- a security office
- a vehicle *
- a typewriter
- an accounts department
- a messenger

The *starred items might be appropriate cost centres; the others might not. Elicit the following criteria for deciding whether or not a given activity or function should be a separate cost centre:

- The costs should be substantial and controllable:
- The function should be one person's responsibility.
- It should not be difficult to apportion the costs on a reasonable basis.
- Most important: the effect of calculating the cost of the proposed cost centre can be more than justified by the possibility of savings which can be made once the cost is known.

Stress that appraisal of past performance and motivation for future improvements is one of the most important functions of cost accounting. Trainees decisions as to the detail in which costs should be allocated between the various functions in societies A and C, will depend to an extent as to whether these departments are under different managers or whether they are under common management. The selection of cost centres is dependent on the scale and type of organisation of the particular co-operative society which is being considered.

3) Write the following simplified operating statement on the chalkboard/OHP:

Societies A, B and C
Results for 1984

Revenue	100,000
Costs	90,000
Surplus	10,000

Ask trainees what additional information is normally required in order for such a statement to be legally acceptable.

In most countries, it may be necessary to show items such as interest charges, bad debts or committee meeting expenses separately. What are the implications for the accounting system if the additional information related to various "cost centres" is to be obtained?

- Costs will have to be collected for:

  Each function (Society A)
  Each vehicle (Society B)
  Each service (Society C)

Ask trainees to suggest what difficulties may arise in collecting such information, and making it useful for management. If necessary elicit their answers by reminding them of the previous session on overhead allocation methods.

- How will the costs of general management, interest charges, committee meetings, education and so on be apportioned?

Remind trainees of the purposes of cost accounting. In addition to costs, what else is needed, in order to provide information for pricing, decision making and appraisal?

4) Write the following example on the chalkboard/OHP. What other information is needed before any judgement can be made?

Costs of X Department

1983	10,000
1984	12,000

Clearly some indication of output is needed, so that costs can be related to activity. The 20% increase in costs may have arisen because of inflation, because of a 50% increase in volume, or in spite of steady prices and/or a decline in volume.

Remind trainees of the difficulties of fairly apportioning overheads in an input supply operation. The problem arose because it is difficult to decide whether output is to be measured in volume, weight or cubic metres. The same problem arises when determining any sort of output.

5) Write the following list of departments on the chalkboard/OHP, if necessary substituting functions which are familiar to trainees:

Transport Service
Invoicing Department
Contract Ploughing Service
Secretarial Department
Marketing Department

Allow trainees up to 15 minutes to write down as many ways as possible by which the output of each of these departments might be measured.

Elicit suggestions from trainees, which should include the following:

- Transport:
  (a) Journeys undertaken.
  (b) Kilometers driven.
  (c) Ton kilometers carried.
  (d) Tons carried.

- Invoicing:
  (a) Value invoiced.
  (b) Numbers of invoices issued.

- Ploughing:
  (a) Hectares ploughed.
  (b) Members served.
  (c) Revenue received.

- Secretarial:
  (a) Letters typed.
  (b) Total society turnover.
  (c) Periodic recording of costs month by month only.

- Marketing:
  (a) Value sold.
  (b) Tonnage sold.
  c) Surplus earned.

Discuss each suggestion. Ask trainees to imagine themselves to be the manager responsible for each department, and to imagine how they might feel unjustly treated if their performance was measured only by reference to the costs of their department in relation to each of the performance measures suggested. Elicit problems such as:

- Transport:
  (a) Journeys might be longer.
  (b) Heavier loads might be carried.
  (c) More pick up and dropping points might be required.
  (d) More kilometers might have to be driven.

- Invoicing:
  (a) More individual invoices might be needed.
  (b) Each invoice might be more complex.

- Ploughing:
  (a) The fields might be more distant.
  (b) The members might require more ploughing each.
  (c) Cost might increase, or charges might be kept down inspite of cost increases.

- Secretarial:
  (a) Letters might be longer and other work involved.
  (b) The number of letters per $1,000 of business might increase.
  (c) Wages might increase.

- Marketing:
  (a) Greater sales effort might be needed.
  (b) The number of customers might increase.
  (c) Competition might increase, or prices might be held down.

6) Stress that there is no perfect measure of performance. Ask trainees which of all the suggestions made is most nearly representative of the real value of output.

Elicit the answer that it is the revenue received, for the ploughing service. Stress that very few departments actually charge members or others for their service. They form a part of the total services of the society.

A society itself must be evaluated by reference to its costs in relation to its revenue, that is its surplus, but individual departments can rarely earn a surplus on their own. Some artificial measure of performance must be found, which must be sensibly interpreted because of problems of the type already identified by trainees.

7) Ask trainees to suggest the advantages of dividing a society's operation into as many individual cost centres as possible:

- Clearly, this would increase management's knowledge and control of every function.

What are the disadvantages?

- The cost of collecting and presenting the information.
- The complexity of the resulting system.
- The difficulty of explaining certain information to the very junior staff who would necessarily be responsible for the smaller cost centres.

Ask trainees to suggest criteria for determining cost centres. Elicit the following suggestions:

- Each cost centre should be the responsibility of an individual who can be held accountable for it and will be capable of collecting and using the information about his or her cost centre.
- The total costs of the centre must be sufficiently high to justify the cost of collecting and presenting information.
- The costs should be sufficiently likely to vary to be worth collecting and controlling.

Summarise these conclusions on the chalkboard/OHP, and write up the following list, or a similar list drawn from trainees' experience:

- Individual vehicles in a transport operation.
- Individual typists in an office.
- Separate departments in a processing society.
- Individual extension staff.
- Small local collection and processing centres.

Ask trainees to decide which of these items should be constituted as separate cost centres, and which not, and why.

Elicit the following suggestions:

- Each vehicle should be a cost centre. Fuel, spares and maintenance costs for each vehicle should be collected separately, because they can vary with driver's performance, the age of the vehicle and the workload it carries.

- Individual typist's salaries are unlikely to vary unexpectedly. The cost of supplies used is very small and normal supervision should ensure that all typists are properly and productively employed. The secretarial operation as a whole should be a cost centre.

- Separate departments should be individual cost centres. They may vary, losses on one may be concealed by increased efficiency in another, and it may be necessary to decide at some time to expand, contract or discontinue a particular function.

- Individual extension staff salaries are unlikely to vary, and their associated costs are generally not large. Effective field supervision is vital, since their output is also very difficult to measure. Cost centre accounting alone cannot effectively control the costs and value of an extension service.

- Branch collection and processing centres should be costed separately, since they can easily be mismanaged and may be totally uneconomic.

8) Ask trainees to describe the cost centres into which their own societies are divided. If, as is possible, many are not so divided at all, discuss the situation in the light of this session and invite suggestions as to how they might be divided in future.

Stress that while it may be appropriate to select cost centres on the basis of the manager's responsibility, it may also be appropriate to consider reorganising a co-operative society in order to make individual managers responsible for individual cost centres, whose costs and output can be measured as has been discussed in this session. If the organisation of a large society is such that nobody except the general manager feels that he is actually responsible for a complete operation whose output and costs can be measured, it is unlikely to be managed effectively. A reorganisation and the introduction of cost centre accounting may make a dramatic improvement to management motivation and performance.

SESSION 3.3

COST DATA COLLECTION

Objective: To enable trainees to design and operate systems for collecting the data necessary for a cost accounting system.

Time: 12 to 2 hours.

Material: Case study "The Consolidated Society A".

Session Guide:

1) Distribute the case study. Divide trainees into groups and allow them up to 45 minutes to complete the assignment.

2) Reconvene the groups, and ask representatives from each group to present their conclusions.

A possible monthly analysis might be as follows:

- Collect all fuel, maintenance (time, outside bills and spares), drivers' wages, depreciation and license and insurance costs for each vehicle separately, to show its total cost of operation.
- Allocate all vehicle costs, collected as above, to the separate functions of:
  - crop collection,
  - crop delivery,
  - supply collection,
  - supply delivery,
  - member hire,
  - general administration,
  - extension,

  on the basis of the kilometers run for each function, to calculate the total cost incurred in each function.

- When possible, compare the costs of each function, collected as above with some other measure. Examples:

  - Compare the cost of individual farm supply deliveries with a five percent surcharge on the deliveries.
  - Compare the cost of bulk collection of farm supplies with the cost of the same service from outside contractor.
  - Compare the cost of crop deliveries to the Marketing Board with the cost of the same service from outside contractor.
  - Compare the cost of member hire with the hire charges raised from members.
  - Compare the cost of collection of crops with the tonnage of crop collected.

3) The groups may suggest more or less detailed analyses. Ensure that they put forward the reasons for what they suggest, that is the ways in which the manager will actually be able to use the information provided in order to improve the efficiency of the transport operation.

The above suggestions could be used as follows:

- Individual vehicle operation costs: to monitor the efficiency of each vehicle, to assist in replacement decisions, to compare and motivate driver's performance.
- Allocation of vehicle costs to functions according to kilometers driven: to prevent misuse by ensuring that every kilometer is allocated to a specific function, to monitor the cost of each function in order to decide whether or not to continue it or to replace it with an outside contractor, to help to decide on the charges to be made to members, to help to decide whether farm supplies should be purchased from suppliers including delivery.

Ensure that trainees understand exactly how the information could be used to assist in decisions of this type. Stress that costing data does not actually make decisions, it merely provides information which helps managers to make better decisions.

4) Stress that the value of any information must not be exceeded by the cost of collecting it. Ask the group which have suggested the most complex analysis to state how they would collect the information. They should specify exactly what documents would be used, by whom, so that the administration load is fully understood.

The analysis suggested above might be based on information collected as follows:

- Every vehicle has a monthly log card, in which every kilometer it runs has to be allocated to one of the functions. Each journey must be authorised, on the card, by the manager or supervisor responsible for that function.
- The vehicle mechanic must allocate every hour of his time, and every item of spare parts purchased or used, to a particular vehicle. He must record this allocation as the work is done, which should be acknowledged by the responsible driver, in writing.
- Certain materials such as cleaning rags, small tools, nuts and bolts and so on need not be allocated to vehicles, but their costs should be allocated to the mechanic's wage and according to the kilometers run by each vehicle.
- The cost of any maintenance jobs done outside, in emergency, or because they are beyond the capacity of the society's mechanic, must be allocated to that vehicle, and noted on the mechanic's monthly report of what he has done.
- All fuel issued or purchased must be allocated to specific vehicles. Issues from the society's own pump must be recorded on a sheet which accounts for every litre issued, and no bills for fuel from outside garages should be accepted unless they are marked with the number of the vehicle using the fuel.
- All "fixed" costs, such as depreciation, wages, licenses and insurances should be allocated to individual vehicles and a monthly fixed cost of operation should be calculated for each vehicle.
- At the end of every month, the total fuel, maintenance and "fixed" costs of each vehicle should be added together, and

divided by the total kilometers run, to give a cost per kilometer for that vehicle.

- The vehicle log sheet should be used to total the kilometers run for each function, and the cost of transport for each function should be calculated by multiplying the total kilometers run by the cost per kilometer, for each vehicle.
- The total cost of transport for each function should be compared with the "value" of output, calculated as suggested earlier, for that function when it is possible. When it is not possible, it should be compared with the costs for previous periods, or with budgets or with results from other societies with similar operations whose managements have agreed to exchange figures.

5) Discuss the administrative feasibility of the groups' suggestions, and/or the above proposal, given the level of competence and honesty in trainees' societies.

Ask trainees for suggestions as to how the above system, or their own proposals, might be simplified:

- The motorcycle expenses could be combined.
- If any particular vehicle is only used for one particular function, its whole cost can be charged to that function without further difficulty.

Remind trainees that the objective of cost accounting information is not to prove that the activity in question is viable, but to find out whether it is viable or not, to monitor its performance and to show how it can be improved. Trainees should avoid the temptation to distort figures in order to make a case; cost accounts should be unbiased.

6) Ask trainees if they have any problems with controlling the use of transport in their societies. Elicit problems such as:

- Staff and members use vehicles for their own private purposes, without payment.

- Fuel and spare parts are purchased, but not always used for the society's vehicles.
- Staff and members use the society's maintenance facilities to repair their own private vehicles, without charge.

Ask trainees how the proposed system, or their own suggestions, can minimise misuse of this kind. Stress that paperwork routines cannot totally eliminate such problems, and are no substitute for effective management. They can, however, make it easier for a good manager to run an efficient transport service and to minimise its misuse.

Managers themselves must of course set a good example, by not misusing societies' vehicles for their own purposes. If private use is permitted, this should be openly acknowledged and accounted for by a system such as has been suggested.

The material in this and other sessions has concentrated on transport, because this is a function which is carried out by large numbers of co-operative societies in all parts of the world, and because nearly everybody is familiar with the way vehicles are operated and organised, even if they are not responsible for managing them themselves.

It is important that trainees should appreciate that the same principals apply to any kind of activities; if most trainees are involved in a particular form of grain milling, cash crop processing, packing or other activity, additional material should be produced in order to take account of this.

It may be appropriate to ask an auditor or other authority who is familiar with costing whatever processing activities are common amongst co-operatives managed by trainees to advise on the details of the costing that should be employed, and if necessary to be present at this and other sessions. All professional recommendations, however, should be treated with caution and should be "tested" by asking the following questions:

- Does the fact that this information is available make any difference to anybody?
- Does the cost of collecting this information exceed its value?
- Is it possible for this information to be collected quickly enough for it to be any use for management in making practical improvements?

The Consolidated Society A

The manager of the Consolidated Society wondered what was the purpose of official accounts he had to prepare, except as a way of keeping the registrar quiet. Members did not understand them, and he had found them to be of little value when he tried to apply what he had learnt about costing in a management course at the co-operative college.

This society was a fairly large multi-purpose organisation, providing a wide range of services to members. Crops were collected, stored and marketed, using the society's vehicles which were also used for transporting and delivering farm supplies to members. These vehicles were the manager's major problem, or rather, he needed to know if they were a problem or not.

There had recently been a national scandal about misuse and inefficiency of co-operative transport facilities, and every society had been asked by the registrar to show that their transport operation was well managed and efficient. Any society which could not prove the viability of its transport operation might in future be compelled to give up the transport and to rely on the National Co-operative Union's transport service. The manager knew that this would be a disaster for his society as well as a severe blow to his personal prestige.

The society owned a Land Rover, four three ton trucks and two motorcyles for the extension staff. The vehicles were maintained in the society's own garage, by a full time mechanic, and day-to-day servicing of each vehicle was the responsibility of its driver. The vehicles were used for collecting members' crops and bringing them to the store, and then for delivering accummulated crop, some months later, to the Marketing Board. They were also used for delivering farm inputs from suppliers to the society's warehouse, and for making individual deliveries to members. A five percent supplement was added to the cost of farm inputs which were delivered to members' farms for them.

Members also hired the vehicles and the drivers for any services they wished, when they were not otherwise employed. The Land Rover was mainly used by the manager and his staff for personal transport on the society's business, and for collecting spare parts, or cash from the

bank, transporting visitors, delivering urgent individual items to members and other administrative purposes. The motorcycles were only used by the extension staff.

The vehicles were of varying age and makes, and some were more reliable than others. It cost a great deal of money to buy, maintain and run the vehicles, but the manager always considered it a worthwhile exercise. He found it difficult, however, when he examined the figures in the accounts, to see what proof they provided which might satisfy the registrar or even himself.

After some brief analysis the manager succeeded in extracting from the society's figures the following information relating to the transport service. This was clearly not adequate for his purpose, and he wondered what further information he needed in order to demonstrate the viability of the operation, and how he could obtain it.

Item	1983	1984
Fuel and Oil Costs	7,000	10,450
Drivers' Wages	2,800	3,000
Mechanic's Wages	900	1,000
Depreciation of Vehicles (on five year basis)	14,600	14,600
Licenses and Insurance	2,150	2,150
Tyres and Spare Parts	5,000	5,300
Outside Maintenance Costs	2,500	3,000
Total Costs	34,950	39,500

Assignment:

1) What information does the manager need in order to find out whether the transport service is viable or not?

2) How should the manager analyse the data above for the transport service in order to obtain the information he needs? Be prepared to explain how he can use the analysis you suggest.

3) What documents will be needed to collect the information together in the way you recommend?

topic

4

cost control

SESSION 4.1

WHY COSTS CHANGE

Objective: To enable trainees to distinguish between changes in costs which are caused by volume, efficiency and by price and to suggest appropriate remedies when necessary.

Time: 2 to

Material: Case study "The Consolidated Society B".
Supplementary Data Sheet.

Session Guide:

1) Trainees should remain in the same groups as for the previous session. Distribute the case study "The Consolidated Society B". It presents one way of analysing the data given in the "A" case in the previous session.

   If the general conclusion in the previous session has been that the costs of the transport operation should be analysed and presented in a radically different way, it may be necessary to explain the justification for the method of presentation which is used. Advise the groups that if they feel they need more information, they should ask the instructor for it. They should not, however, ask for information which could not reasonably be obtained and they should only be given information from the data sheet for which they specifically ask in writing. They should not be given the whole sheet.

   Information from the data sheet should only be given to those groups that ask for it and they should not share it with groups which have not found out for themselves that it is necessary.

   This exercise is not easy; the instructor should go through it before the session, and decide how far, and in what detail, the particular group of trainees should be able to analyse the data.

It may be appropriate to ask them only to analyse the results for the motorcycle, or possibly lorry B as well, so that they can concentrate on a restricted problem at first. Stress however, that the transport fleet is not a large one, and that the more comprehensive analysis which is suggested in the session guide is necessary if the manager is effectively to control the costs of transport.

Allow up to one hour for groups to complete the assignment, with or without the additional information.

2) Ask group representatives, in turn, to present their analyses and conclusions. Ensure that they make specific suggestions for action by the manager, rather than general statements such as "take steps to reduce fuel consumption".

3) The groups' presentations should demonstrate their understanding of the need to ask three types of questions in relation to cost changes of this sort:

- How much of the change can be explained by price changes?
- How much of the change can be explained by different levels of activity?
- How much of the change can be explained by better or worse performance and management?

Elicit these distinctions by questions such as the following:

- The costs of operating Lorry B have increased by about 9% between 1983 and 1984, whereas the costs of Lorry D have increased by about 86%. Does this necessarily mean that Lorry B has been more efficiently operated than Lorry D?

  Clearly not, because the kilometers driven by Lorry B have gone down by one-third, while Lorry D has done five times the distance.

  Some of the difference is due to the level of activity.

- The cost of fuel used by the whole fleet has increased by about 50%. Does this show that fuel has been wasted?

Not necessarily, because the cost of fuel has increased.

Some of the difference is due to changes in price.

- The cost of input collection has gone from $1,000 down to $300. Is this the result of better management?

  This reduction is partly the result of lower activity, but 1984's activity is only one-third that of 1983. Clearly the reduction would have been larger but higher costs and less efficient management have both contributed to the costs being higher than it should be.

  Some of the difference is due to management.

4) Trainees will appreciate that it is necessary to find a way of determining what proportion of cost changes can be explained by changes in activity, price and efficiency.

Work through the example of the motorcycle as follows:

	1983	1984	Increase
Total cost per kilometer	3 cents	3.17 cents	6%
Actual fuel cost per kilometer	1.5 cents	1.5 cents	
1984 fuel cost per kilometer if it had reflected price increase of 25%		1.875 cents	
Difference in actual from theoretical fuel cost per kilometer		0.375 cents	
Fuel saving due to better management 0.375 cents x 30,000 kilometers		$112.50	
Cost of maintenance per kilometer, in-house and outside	1.5 cents	1.67 cents	11%
1984 maintenance cost per kilometer if maintenance had reflected general price increase of 10%		1.65 cents	
Difference in cost per kilometer		0.02 cents	
Extra costs of maintenance over price rise 0.02 cents x 30,000 kilometers		$ 6	
Net benefit due to improved management $112.50 - $6		$106.50	
Extra costs due to higher activity		$243.50	
Total cost difference		$350	

5) Ask trainees to make similar calculations for Lorry B.

Their answers should be approximately as follows:

	1983	1984	Increase
Total cost per kilometer	19.3 cents	31.5 cents	63%
Actual fuel cost per kilometer	11.3 cents	15 cents	33%
1984 fuel cost per kilometer <u>if</u> it had only reflected price increase of 25%		14.13 cents	
Difference in fuel cost		0.87 cents	
Fuel costs increased due to lower efficiency 0.87 cents x 10,000		$ 87	
Cost of maintenance per kilometer in-house and outside	8 cents	16.5 cents	106%
1984 maintenance cost per kilometer <u>if</u> it had only reflected 10% price increase		8.8 cents	
Difference in cost per kilometer		7.7 cents	
Extra cost due to lower efficiency 7.7 cents x 10,000		$ 770	
Total cost increase due to lower efficiency $87 + $770		$ 857	
<u>Less</u> reduction expected because of lower usage		$ 607	
Total cost difference		$ 250	

6) Ask trainees what they would recommend that the manager should do. Can he at once conclude that the lorry has been inefficiently or dishonestly managed, and that the motorcycle has been efficiently managed?

Clearly further inquiries may be necessary; ask trainees to suggest what further information they might need:

- Was there a fundamental improvement in the roads over which the motorcycle ran?

- Was the high motorcycle service cost in 1983 incurred on a major overhaul or other unusual requirement which made the cost for that year unusually high, and therefore gave an exaggeratedly favourable impression for the following year?
- Was the high maintenance cost for Lorry B in 1984 incurred because of a particular unusual overhaul or repair?

Stress that data such as trainees have calculated can nevertheless be used as a basis for management improvement. Ask trainees to suggest reasons for the higher fuel consumption of Lorry B in 1984:

- Fuel may have been wrongly booked to this vehicle.
- The kilometer counter may have been inoperative, or tampered with.
- Bad roads, bad maintenance or the age of the vehicle may have increased consumption.

Clearly all these could call for management action.

7) Ask trainees whether good management of transport involves more than measuring, over the long term, the cost per kilometer run. Are they familiar with problems such as unauthorised private use of official transport or badly organised journeys? Would these be avoided by minimising the cost per kilometer?

Elicit the suggestion that management must try to measure the cost per kilometer and the number of kilometers driven to achieve certain objectives.

Ensure that trainees grasp this principle. Refer to other functions such as typing letters, operating machinery or purchasing supplies such as bags or fuel; the cost per unit and the volume or output must be controlled. Use the example of fertilizer or even a simple household item such as sugar:

- The cost of the item should be as low as possible,

and

- It must be used efficiently.

Even if the fertilizer is of high quality and very inexpensive, it is no use if it is used for the wrong crops, or improperly applied.

In the same way, the "use" of people and equipment to carry out the various tasks within a co-operative must be as economical and efficient as possible.

8) Remind trainees that the cost of performing each transport service was calculated according to the number of kilometers booked to each service by each vehicle. Ask trainees how they might use the figures to appraise the efficiency of the various transport services.

If a particular service has used far too much transport, even if that transport was itself run very economically, this obviously requires improvements.

Ask whether they would judge the extension service to have been well managed, if the 1984 kilometers run were the same, but six ton lorries instead of motorcycles were used. Clearly this is an absurd example, but management must use the most economical vehicle, as well as minimising the use of whatever vehicle is involved.

Ask trainees for examples of appropriate and inappropriate uses of equipment, or people, which are similar to using a lorry for carrying one person. Elicit examples such as sending a team of labourers to do a simple cleaning job requiring one man, or a manager to act as a messenger.

9) Elicit through discussion some approaches such as the following:

- Overall 1983/1984 increase in costs of transport is 28%. If the average rate of increase is applied to those services for which a measure of output is provided, we get the following results:

Service	1983 Cost per Unit of Output	Theoretical 1984 Cost per Unit of Output (1983 + 28%)	1984 Output	1984 Result at Theoretical Cost per Unit	Actual 1984 Result	Difference
Crop Collection	$4.90/ton	$ 6.27	1,300 tons	$ 8,151	$ 10,000	$ $1,849
Crop Delivery	$3.22/ton	4.12	400 tons	1,648	1,000	648
Supply Collection	$1 per $1 Value	1.28	$100	128	300	172
Supply Delivery	$0.57 per $1 Received	0.73	$2,000	1,460	1,000	460
Members' Hire	$1.83 per $1 Received	2.34	$400	936	1,500	564

Ensure that trainees understand the origin of the figures and the purpose, which is to exclude the effects of higher costs, by accepting the 28% increase, and thus concentrating attention on the efficiency of use.

Ask trainees to suggest which of these results are favourable, and which unfavourable. Elicit the responses as follows:

Crop Collection:	Overspent	-	Unfavourable
Crop Delivery:	Underspent	-	Favourable
Supply Collection:	Overspent	-	Unfavourable
Supply Delivery:	Underspent	-	Favourable
Members' Hire:	Overspent	-	Unfavourable

Ask trainees to comment on the results. What further information would they need, and what remedial action, if any, would they suggest?

- Any fundamental changes in the nature of each service, such as larger or smaller loads, or more frequent drops or pick-ups, should be investigated.
- The charges for member hire should be increased, or possibly some members are avoiding being charged at all.

- Any transport service, such as supply delivery to the society's store, which might be carried out more cheaply by outside contractors, should be carefully appraised, and, if necessary, given to an outside contractor for a trial period.
- Apparently well managed services, such as crop delivery to the Marketing Board, or individual delivery of supplies to members, should be investigated. Can the lessons learnt from these be applied to other services, or have more fundamental changes caused deceptively good results?

10) Ask trainees how they will appraise the efficiency of the services for which it has not been possible to identify a means of output. They should identify these as general administration and extension.

- Extension: This is wholly carried out by the motorcycles. The data does not therefore provide any separate way of evaluating their use as opposed to their cost per kilometer of the ser vice. The quality of extension must be monitored by good management alone.
- General Administration:

Cost 1983 x "Standard" increases in cost	= $ 4,096
Actual 1984 cost	= $ 5,000
"Extra" cost	= $ 904

The extra administrative cost may be justified by greater activity, which might itself be measured by the society's sales or some similar means. If not, this clearly requires closer control.

11) Some trainees may have manipulated the figures in different ways, or some may feel that the ideas which have been demonstrated are too complex for day-to-day application.

Stress that costs must be controlled, and that control is impossible without:

- Knowing what costs have been for each separately measurable activity or service.
- Comparing and separating the effects of external price changes, efficiency of operation and volume of activity.

Ill-informed attempts to reduce costs will cause ill-will and can easily be countered by responsible staff. All staff, and the others responsible for supervising them, should themselves collect the basic data and be provided with information which shows them the reasons for any changes in cost of functions for which they are responsible.

The Consolidated Society B

The manager of the Consolidated Society had decided after some thought to ask his accountant to prepare a detailed analysis of the transport costs, showing the cost of operating each vehicle, and the cost of each function which was carried out. He studied the results for some time. He realised that it provided him with a great deal of information he had never had before. He hoped it would satisfy the requirements of the registrar, but he felt he should himself be able to identify some areas in particular need of attention, and to take appropriate steps to improve matters. His difficulty was that he could not decide what was most urgent, or what he should do.

The Cost of Operating Each Vehicle

Vehicle	Fuel and Oil		Own Maintenance and Spares		Outside Repairs		Total	
	1983	1984	1983	1984	1983	1984	1983	1984
	$	$	$	$	$	$	$	$
Motorcycles	300	450	200	500	100	nil	600	950
3 Ton Lorry A	2,000	2,500	1,100	1,450	700	200	3,800	4,150
" " " B	1,700	1,500	1,200	1,650	nil	nil	2,900	3,150
" " " C	1,500	2,200	1,600	1,350	300	1,300	3,400	4,850
" " " D	500	1,800	600	1,050	700	500	1,800	3,350
Land Rover	1,000	2,000	1,200	300	700	1,000	2,900	3,300
Grand Totals							15,400	19,750

Functional Allocation of Transport Costs

Function	1983		1984	
	Cost	Output Tons or $ Charged	Cost	Output Tons or $ Charged
Crop Collection	$ 5,400	1,100 tons	$ 10,000	1,300 tons
Crop Delivery	$ 3,700	1,150 tons	$ 1,000	400 tons
Supply Collection	$ 1,000	$ 1,000	$ 300	$ 100
Supply Delivery	$ 400	$ 700	$ 1,000	$ 2,000
Member Hire	$ 1,100	$ 600	$ 1,500	$ 400
General Administration	$ 3,200		$ 5,000	
Extension	$ 600		$ 950	
Totals	$ 15,400		$ 19,750	

Assignment:

1) Which vehicles or function should the manager be most concerned about?

2) Determine the extent to which the problem appears to arise from cost or usage changes.

3) What should the manager do?

Note: You may feel you need additional information which the manager might reasonably have at his disposal. If so, write down specifically what you want to know and give the request to the instructor. You will receive the information, if it is available.

Supplementary Data Sheet

General level of inflation 1983 to 1984 = 10%

Price increase of fuel and oil 1983 to 1984 = 25%

Vehicle	Kilometers Run	
	1983	1984
Motorcycles (Total)	20,000	30,000
3 Ton Lorry A	12,000	15,000
" " " B	15,000	10,000
" " " C	6,000	9,000
" " " D	2,000	10,000
Land Rover	7,000	20,000

SESSION 4.2

MARGINAL COSTS

Objective: To enable trainees to identify those costs which are directly associated with a given activity and to take appropriate decisions based on an analysis of the real effect of increased or decreased activity.

Time: 1½ to 2 hours.

Material: Case study "The Consolidated Society C".
Dialogue: "The Manager and The Superintendent". (This should if possible be enacted by two trainees and put on tape before the session.)

Session Guide

1) Ask trainees to consider any processing activity they are familiar with, such as a tea or coffee factory, a grain mill of any kind, a slaughterhouse or a dairy. If one more kilogram of produce is processed in such operation, what does it cost?

Clearly the additional, or marginal cost of an extra unit is very small, and is far less than the average cost of processing all the units that are handled. Similarly, if one less unit is processed, the cost does not decrease in proportion.

This has important implications for pricing and other management decisions. This session will demonstrate what is involved.

2) Distribute a copy of the case study to each trainee. Allow them up to 15 minutes, individually, to decide whether they support the manager or the farm supply superintendent. They should not at this stage state which "side" they support.

Ask each trainee, individually, to write on a piece of paper which side he or she supports, and to hand it in. They should not be allowed to influence one another at this stage.

Ask all those who support the manager to sit on one side of the room, and the superintendent's supporters to sit on the other. Ensure that nobody changes sides because they see the majority disagrees with them. Refer to their written "votes" to ensure that everybody sticks to his or her first judgement. At this stage, stress that nobody is right, or wrong.

3) Warn trainees that they are to listen to a discussion between the two protagonists. They should note each argument on "their" side, to be sure they understand it, and on the other side, to be prepared to counter it.

Play the tape, or if no recorder is available, ask two trainees to read through their respective roles and to enact the dialogue.

If trainees so request, play the tape through a second time in order to ensure that it has been clearly understood.

4) Ask trainees if they have changed their minds. Given the reasonable arguments which have been put forward on each side, what do they suggest as a compromise, which will balance the need to save money and to motivate managers to do their jobs properly.

Trainees may suggest a number of possibilities; one suggestion might be:

- Do <u>not</u> allow the farm supply superintendent to use outside contractors.
- Make an internal charge to the farm supply department, and to all other departments, based not on the actual cost of transport but on "standard" costs, which may be last year's figures plus an allowance for inflation (as demonstrated in the previous session), the cost of outside contractors or an agreed cost of a reasonably effective transport operation, based perhaps on comparative data received from other societies.
- Make the transport manager responsible for working to the standard costs; any excess will be his responsibility, and will be charged to his department.

- Keep a continuous check on outside contractors' costs and reliability, possibly by using them from time to time, even if this appears uneconomic. There is no reason why a co-operative society should operate a transport service, or any other service for that matter, if the service can be obtained less expensively elsewhere.

5) Remind trainees of the content of Session 2.3; in that case there were no extra costs involved in transporting the fertilizer, because neither the vehicle nor the warehouse were being used at full capacity.

Ask trainees whether any of them can honestly claim that all, or indeed any, of the equipment or machinery owned by their co-operatives is used at its full capacity. Very few will be able to do this; vehicles remain unused for days at a time, typewriters are not always being typed on, warehouses are empty from time to time and very little processing equipment is operated night and day.

Ask trainees why it is often sensible not to operate equipment at its full capacity:

- There is a need for flexibility, and certain services such as vehicles or others need to be available when people need them.
- Maintenance has to be carried out and it is uneconomical to run machinery at full capacity all the time, if this means that maintenance must be neglected.
- It is often cheaper to have under-used equipment, than to sacrifice convenience, flexibility, and people's time by trying to make fuller use of the capacity of equipment that is already available.

Most equipment is nevertheless not used to its full capacity, and is very rarely over-used. Stress that the extra costs of making greater use of machinery, equipment, people's time or other facilities which have already been paid for is often very low. Good managers can identify opportunities for making better use of capacity, even at apparently very low prices, so long as the extra cost associated with the extra hours of operation are more than

covered. Extra costs of this kind are often called "marginal costs" to show that they are only incurred at the "margin", when additional use is made of a facility. "Marginal revenues" are the extra sales that may be made on output produced at the margin.

Ask trainees to try to think of ways in which presently under-used equipment in their societies could be more fully used; elicit suggestions such as:

- Equipment or vehicles could be hired out to members or other societies at very competitive rates, so long as responsibility for any damage was clearly taken into account.
- Two or more co-operative societies might avoid the need for both of them to purchase a piece of equipment if one with surplus capacity makes that capacity available to the others on a marginal cost basis.
- Special seasonal or goodwill contracts for processing, transport or other work can be accepted at apparently very low prices which are in fact profitable to the society.

The Consolidated Society C

The manager of the Consolidated Society always encouraged his subordinates to take responsibility for the functions they controlled, and to make suggestions for improving their efficiency. He was therefore very pleased when the superintendent of the farm supply service said that he had an idea which would save the society money. He asked him to explain, and the superintendent handed him a note which read as follows:

TO: The Manager, Consolidated Society.

FROM: Superintendent, Farm Supply Service.

SUBJECT: Transport of Farm Inputs from Manufacturer's Depot to the Society's Store.

A private transport contractor, who is well known throughout the area and generally reliable, has offered to take over the transport of farm supplies from the manufacturer's depot to the society's store.

In 1983 this cost $1,000 when undertaken by our own transport; the cost fell to $300 in 1984, but, as you know, the volume of deliveries to our store was in fact only one-eighth of the previous year. The cost therefore should have fallen to $125 if it had fallen in proportion with the work actually performed.

In 1985 we anticipate that supplies will be once more available as they were in 1983; the outside contractor has undertaken to deliver our goods as we require. He examined the records of deliveries in 1983 and 1984, and estimated that his charges in each of these years would have been $750 and $100 respectively. These would have been $250 and $200 less than the costs incurred by our own transport. The saving in 1985 will, I estimate, be about $500 based on the present costs of our own transport and the likely volume of supplies to be delivered.

I appreciate that we have in the past always used our own transport, for all purposes, as a matter of course, and that our own vehicles were not fully occupied in 1983 and 1984. The saving is, however, very significant, and should enable me to recommend reductions in the price of supplies to members. Such reductions would, I am sure, be much appreciated.

May I therefore please have authority to place a trial contract with the private contractor at once?

The manager knew that the society's vehicles were unutilised. If he followed the farm supply superintendent's advice, the only saving would be the fuel. All other costs would remain unchanged, and the result would be that all the other departments would have to pay a higher charge for transport. He therefore proposed to reject the suggestion, but decided to call the superintendent to his office in order to explain his decision.

Dialogue: The Manager and The Superintendent

Manager: Thank you for your note about transport. I'm always pleased when our staff try to save money, but I wonder if you have thought through the wider implications of your suggestion?

Superintendent: Well, if we can save $500, I shall definitely suggest price reductions in fertilizer and seed. Nothing very dramatic, but maybe a five percent reduction would be possible. Our members would love that I'm sure.

Manager: Of course they would, but what effect do you think your suggestion is going to have on the society as a whole? Remember, your department is only one part of the whole operation.

Superintendent: Well, I must admit, I was only thinking about my own department. After all, that's what my job description tells me to do.

Manager: Of course it does, but just listen a moment. Do you think that the money we spend on transport would actually have been $300 less in 1984, or $1,000 less in 1983, if the vehicles had not been doing work for your department?

Superintendent: I suppose so, after all, these were the costs charged to my department.

Manager: Yes, they were the total costs, but what would actually have been saved if the lorries had not carried goods for your department? Remember, they were not fully occupied in either year, so they would not have been doing anything else.

Superintendent: Oh, I see what you mean. I suppose that all that would have been saved is the fuel.

Manager: Exactly, and that is about one-half of the total. All the other costs would have gone on as before.

Superintendent: I understand, but all the same, it does seem a bit tough, how can I be expected to "run the farm supply department as economically as possible", as my job description says, if I am forced to use such expensive transport?

Manager: Is it all that expensive though? Remember, we have vehicles at our disposal for urgent jobs at any time; would your private fellow be willing or able to help us out like that?

Superintendent: I suppose not, but I don't need services like that.

Manager: I know you don't, but the society does, and we all have to pay for the benefit.

Superintendent: But surely, we all believe in competition. Members sell their crops through the society not because they have to, but because they get the best deal from us. Surely we should be free to use the cheapest transport services, on the same basis. Competition is good for everyone, including our own management.

Manager: Loyalty is important too, you know. How can we expect our members to support their society, if we don't even use our own transport?

Superintendent: That's true , but I think we ought to recognise that what was the right decision last year may not be right next year. Surely our services should move with the times. Maybe we should not operate a transport service at all in a few years, because private operators are becoming more efficient?

Manager: You'll be suggesting that we should wind up the society altogether next!

Superintendent: Of course not, but the trend in business seems to be towards specialisation. Nobody would dream of suggesting that we should generate our own electricity these days, but we used to. Maybe transport will go the same way.

Manager: You're dreaming about the long term, my friend. I'm concerned with how much money the society is going to make next year, and your idea would mean that we would make less surplus. I don't like it.

Superintendent: We all want to have as big a surplus as possible, but are we going to serve the best long term interests of our members by allowing an inefficient service to exist and forcing ourselves to use it?

Manager: We have a duty to our staff too, you know. What would happen to you, do you think, if we decided to stop the farm supply service?

Superintendent: I hope that I can continue to run it so that members will prefer to buy from us rather than from other suppliers. If I fail, I suppose, I should deserve to go.

Manager: That's all very easy to say when you're not actually in danger of being fired. But anyway, we've spent enough time on this issue. I like your enthusiasm to reduce the costs of your operation, but you must take a wider view. It's the society as a whole we have to consider, and we have to keep our costs down. I'm sorry, we must carry on using our own transport.

SESSION 4.3

STANDARD COSTS AND BUDGETS

Objective: To enable trainees to determine standard costs when preparing budgets.

Time: 1 to 1 1/2 hours.

Material: Exercise "What Should the Grain Drying Cost Next Year?"

Session Guide:

1) Remind trainees of the conclusions of Session 4.1; it is impossible to evaluate the performance of different departments, a society as a whole or of managers, without having something with which to compare results.

Ask trainees how students or athletes motivate themselves to achieve high results; they have targets, or specific goals which they strive to achieve.

Managers in co-operative societies need goals of this sort just like anybody else. Ask trainees why apparently straight-forward goals such as "reduce costs as much as possible" or "achieve as high a surplus as possible" are not necessarily appropriate:

- A high surplus may not necessarily be in members' interests.
- Low costs may mean lower services.
- High output may be achieved by accepting lower quality.

Managers need standards to aim at, and by which to compare their own performance; what standards of comparison were used in the various parts of the Consolidated Society case studies, Sessions 4.1 and 4.2 as a basis of evaluating performance, making decisions about the future and motivating managers to perform effectively?

- Costs were compared with previous years' figures.

- For certain activities, it was possible to design a measure of output, which could be compared with costs.

What were the disadvantages of these approaches?

- Evaluation by comparison with costs for earlier periods was confused by changes in prices which are beyond the control of the responsible managers.
- It is difficult for some activities, and impossible for others, such as general administration, to design measures of output to use as a basis for evaluation.
- Every activity has both fixed and variable costs; the cost per unit of operation is therefore at least partially dependent on volume, and the volume of usage may be beyond the control of the responsible manager.

2) Ensure that trainees understand the latter point, if necessary by using the following example:

- If the cost per ton of drying grain in a society's grain dryer doubles from one year to the next, what might have caused the increase?
  - Higher costs of operating the dryer, such as fuel or labour costs.
  - Poor control of costs, leading to waste and inefficiency.
  - Lower volume of crops to be dried.

Which of these is within the control of the manager responsible for grain drying?

- Only the control of costs.

changes.Use similar examples of transport, processing or administrative functions to demonstrate the three different causes of cost

3) Ask trainees to suggest what is needed in order for managers to be able properly to evaluate cost performance, and to ascribe respon-

sibility for cost changes. What would be a better measure of performance than comparing with earlier periods or "artificial" measures of output?

Remind trainees of Session 4.1; elicit the conclusion that some sort of standard is needed, on which a budget can be based together with a means of explaining deviations from the standard.

Trainees may be all familiar with the annual task of preparing budgets, which are sometimes treated as if they are an end in themselves. Stress that budgets are no more than a forecast of a future period's performance, which is based on certain estimates of what standards should and can be achieved.

4) Distribute a copy of the exercise to each trainee; allow up to 15 minutes for them to put together a budget for the grain dryer for next year.

Ask trainees for their answers, and ask one or more to describe how he or she calculated their figures. The calculations should be as follows:

Item	This Year	Change	Next Year
Grain volume	1,000 tons	+ 25%	1,250 tons
Fuel (@ $1.20 per ton dried)	$ 1,200	+ 25% volume and + 20% price	$ 1,800
Labour	$ 800	+ 25% price	$ 1,000
Repairs	$ 600	+ 1/3	800
Depreciation	$ 1,400		$ 1,400
Totals	$ 4,000		$ 5,000
Budgeted cost per ton	$ 4		$ 4

5) Ask trainees to put themselves in the position of the superintendent who is going to be responsible for the dryer next year, and will be expected to work to or even improve upon the budget. Which of the following approaches from the manager would they prefer, and which would they be more likely to accept?

(a) A memorandum from the manager giving the new figure of $4 a ton and instructing you to use this as the basis for your performance in 1984?

(b) A discussion with the manager, in which he puts forward the new figure and requests you to work to it, and asks whether you foresee any difficulties in this?

(c) A discussion with the manager, based on the information in the exercise, and leading to a joint decision on the budget?

(d) A memorandum from the manager, giving you the figures in the exercise and asking you to calculate the budget and then to present and discuss it?

Trainees should appreciate that managers will respond best to budgets they have set for themselves. Generally speaking, in fact, people may be expected to set too high standards for themselves, so that management may have to reduce rather than increase them. Approach (d) or possibly (c) are more likely to lead to good performance than approaches (a) or (b).

6) Budgets are often regarded as a bureaucratic nuisance, which have to be prepared each year and can then be forgotten until the actual results are known a year or more later. Variations from bud get are then explained or excused, and management proceeds as before.

Stress that budgets should and can be a valuable management tool, for regular use if:

- they are based on careful estimations of standard costs;
- they are prepared in consultation and agreement with those directly responsible for managing each cost centre;
- they are regularly and rapidly compared with actual costs, and variances from budgets are carefully analysed.

What Should the Grain Drying Cost Next Year?

The manager of the Grain Society had decided to make his processing superintendent responsible for the operation of the society's grain drier next year. He wanted to be able to give the superintendent a definite budget to work to, and he therefore examined his notes of the costs and performance of the drier during the present year, in order to decide what he should expect the next year:

Fuel @ $1.20 per ton dried	1,200
Labour	800
Repairs	600
Depreciation	1,400
Total	4,000

Tons dried = 1,000
Drying cost per ton = $4

Fuel costs were expected to increase by 20% next year. Co-operative workers would be given a 25% increase in wages. Repair costs were expected to increase by one-third, because of higher costs of imported components. The grain drier should easily be able to dry twice as much grain next year, with the same labour, and only the fuel consumption would be expected to increase in line with the higher volume. The manager was not worried about whether they would be able to cope with the 25% increase in members' crop production that was expected, based on members' increased plantings and greater uses of fertilizer.

Question: What standard cost, in total and per ton, should the manager choose for the grain drying next year? What should the budget be?

SESSION 4.4

VARIANCE ANALYSIS AND THE USE OF STANDARD COSTS

Objective: To enable trainees to determine the causes of variances from standard costs, and to suggest appropriate changes when necessary.

Time: 1 1/2 to 2 hours.

Session Guide:

1) Refer to the previous session. Remind trainees that they calculated a standard for the grain drying operation, and discussed how the manager should set such a standard with the staff responsible for working to it. It now remains to see how the standard can be used to evaluate performance and to explain changes in costs.

   Ensure that all trainees have their copies of the exercise from the previous session, and a note of the calculations of the estimated costs and resulting standard cost per ton of $4. Warn them that they will be shown a number of different results for next year's operations. Their task will be to compare these with the expected standard, and to explain the variances from standard.

2) Display the following sets of figures on the chalkboard/OHP. Ask trainees to explain the variances in each example; how much is due to changes in volume and how much to changes in price?

   Example A

Fuel	=	$ 1,584
Labour	=	1,000
Repairs	=	800
Depreciation	=	1,400
Total	=	$ 4,784
Quantity	=	1,100 tons
Cost per ton	=	$ 4.35
Standard cost per ton	=	$ 4.00
Unfavourable variance	=	$ 385 or 35 cents per ton

Answer:

Variable costs (fuel) = $1,584 = $1.44 per ton, as standard.

Fixed costs = $3,200 in total (as standard).

Fixed costs per ton at standard volume	=	$ 2.56
Fixed costs per ton at actual volume	=	$ 2.91
Difference	=	$ 0.35

Therefore the whole variance is caused by the lower than expected volume.

Example B

Fuel	=	$ 1,800
Labour	=	1,100
Repairs	=	1,000
Depreciation	=	1,400
Total	=	$ 5,300
Quantity	=	1,250 tons
Cost per ton	=	$ 4.24
Standard cost per ton	=	$ 4.00
Unfavourable variance	=	$ 0.24 per ton or in total $300

Answer:

No volume change.

Variable costs (fuel) as standard.

Fixed costs have increased over standard; the variance is due either to increases in the prices of fixed costs, above those estimated, or to greater use of labour or repairs than was allowed for. These should be investigated.

Example C

Fuel	=	$ 2,150
Labour	=	900
Repairs	=	800
Depreciation	=	1,400
Total		$ 5,250
Quantity	=	1,200 tons
Cost per ton	=	$ 4.375
Standard cost per ton	=	4.00
Unfavourable variance	=	$ 0.375 per ton or in total $ 450

Answer:

Volume is 50 tons lower than standard.

Fixed costs = $ 3,100 as standard.

Fixed costs per ton = $ 2.583 at actual volume

" " " " _ $ 2.480 at standard volume

go it of " _ $ 0.103 variance caused by lower volume

Variable costs	$ 1.792	per ton
Standard costs	$ 1.44	per ton
Unfavourable variance	$ 0.352	caused by increase in use or price of fuel. This should be investigated.

Trainees will see that these two figures total 45.5 cents; these exceed the total variance by 8 cents. How can they explain this anomaly?

- The cost of labour is $100 below standard; this is 8 cents per ton better than expected. The total explanation of the variance is therefore:

  10.3 cents of the variance was caused by lower than expected volume. 35.2 cents of the variance was caused by higher price or more use of fuel. Were it not for the saving of 8 cents per ton on labour, the total variance would have been 45.5 cents per ton rather than 37.5 cents per ton.

Ask trainees how the information could be used to motivate management and members:

- Members could be told that their lower than expected crop production had increased the costs of drying by 10 cents a ton.
- The responsible manager could be congratulated for having made more economical use of labour. Fuel costs should clearly be closely investigated.

Example D

Fuel	=	$ 2,310
Labour	=	1,000
Repairs	=	1,000
Depreciation	=	1,400
Total		$ 5,710
Quantity	=	1,500 tons
Standard cost per ton	=	$ 4.00
Actual cost per ton	=	$ 3.81
Favourable variance	=	$ 0.19 per ton or $285 in total

Answer:

Trainees may feel that this is a cause for congratulation. If costs are so far below standard what need is there for closer investigation?

Stress that overall improvement may conceal lower than standard results in some areas. The purpose of variance analysis is to decide what caused the variance, and it is equally necessary when the overall results are better than expected as when they are worse.

Fuel costs	= $1.54 per ton, i.e. 10 cents per ton over standard
Repair costs	= $200 over standard, or 16 cents per ton over standard
Fixed costs	= $2.72 per ton at standard volume (1.250 tons)
	$2.27 per ton at actual volume (1,500 tons)
Difference	$0.45

The explanation is therefore as follows:

- The higher than expected volume should have caused costs to be 45 cents per ton lower than expected.
- 10 cents higher than standard fuel costs per ton reduced the improvement to 35 cents per ton.

- 16 cents higher than expected repair costs reduced the improvement even more, to 19 cents per ton only.

Trainees should grasp the significance of this example. The great improvement caused by the higher than expected volume concealed the extra costs caused by higher than expected repairs and high cost of fuel.

3) It is easy to concentrate on the mathematics of these exercises, and to forget that variance analysis must be applied to real figures, and must lead to genuine corrective action.

Ask trainees to suggest processing operations with which they are familiar where this technique should be used. Ask for specific examples which demonstrate the importance of separating out the effect of:

- volume
- prices
- management

What improvements might trainees have been able to make in the past if they had had the necessary data and had analysed it as suggested?

Stress that analysis of variances, and subsequent management action, must depend on:

- efffective and timely collection of cost information;
- selection of useful cost centres;
- appropriate apportionment and allocation of costs to cost centres;
- good estimates of future volume and prices as a basis for standard costs;
- effectively motivated management.

SESSION 4.5

COST OR USAGE

Objective: To enable trainees to determine the extent to which variances are caused by deviations in use or in prices.

Time: 1 to 1 1/2 hours.

Material: Exercise: "The Variant Society".

Session Guide

1) Remind trainees of the previous session and of Session 4.1. It is particularly vital that trainees should have grasped the content of these sessions as a basis for understanding the technique introduced here. They were then able to determine what proportion of a variance from standard was caused by changes in volume, and what by changes in the cost of inputs that were used. What further analysis is required?

Remind trainees that the purpose of analysing variances is to direct management's attention to the real causes of cost changes, so that they may take appropriate action. What type of actions can be taken to reduce costs, other than making greater use of the facility?

- The quantity of a given supply such as fuel, labour or materials can be reduced.
- The cost of the supply can be reduced.

It is clearly necessary to know which of these steps should be taken, since the actions in each case are very different.

2) Ask trainees to consider the cost of labour in their own societies. If the cost is higher (or lower) than expected, what may have been the cause?

- More (or less) labour time than expected may have been worked to complete the tasks, that is labour was used more (or less) efficiently.

- The cost per hour or per month of the labour may have been higher (or lower) than expected.

Trainees should appreciate that the cost of fuel, repairs, animal foods or any other input can vary in the same way.

3) Distribute the exercise and allow trainees individually up to ten minutes for Question a). Circulate among trainees and if necessary give individual advice. If very few or none of the trainees are able to calculate the answer, lead them through to the answer, as a group.

4) Elicit the various steps in the calculation from trainees as follows:

Actual Production = 60 tons.

Standard Cost of Actual Production:			$	
Ingredient	A 60 x 500 kilograms	@ 10 cents	3,000	
"	B 60 x 200	@ 20 cents	2,400	
"	C 60 x 200	@ 6 cents	720	
	D 60 x 100	@ 30 cents	1,800	
Total	60,000		$ 7,920	or $132 per ton

Actual Cost of Actual Production:

Ingredient	A 29,000 kilograms	@ 12 cents	3,480	
"	B 13,000	@ 24 cents	3,120	
"	C 14,000	@ 4 cents	560	
"	D 4,000	@ 25 cents	1,000	
Total			$ 8,160	or $136 per ton

Variance = $240 or 4 cents a kilogram.

5) Trainees may feel that the variance is so small that it is not worth further analysis. Remind them of the previous session. Results which are close to standard may conceal some very serious problems since performance which is much better than standard, perhaps through no effort of the manager, may conceal other items which have been grossly overspent.

Ask trainees how they can analyse the overall variances into those parts caused by price changes and those parts caused by usage change (Question b). Elicit the following approach:

- The price variance is the difference between the actual and the standard price, multiplied by the actual usage.
- The usage variance is the difference between the actual and the standard usage, multiplied by the standard price.

For example, the calculation for Ingredient A should be as follows:

- Price Variance = (12 cents - 10 cents) x 29,000 kilograms
  = $580 or 9.66 cents a ton.
- Usage Variance = (30,000 kilograms - 29,000 kilograms) x 10 cents
  = $100 or $1.66 a ton.

Ask trainees what is different about these two variances, elicit the fact that the price variance is <u>unfavourable</u>, that is the price is <u>higher</u> than expected, while the usage variance is <u>favourable</u>, that is the usage has been <u>lower</u> than expected.

Allow trainees individually up to 15 minutes to complete the calculations.

The complete set of results, for all four ingredients, should be laid out as follows:

Ingredient	Price Variance	x	kg	=	Total	Usage Variance	x	cents	=	Total
A	- 2 cents	x	29,000	=	-$ 580	+ 1,000 kg	x	10	=	+$ 100
B	- 4 cents	x	13,000	=	-$ 520	- 1,000 kg	x	20	=	-$ 200
C	+ 2 cents	x	14,000	=	+$ 280	- 2,000 kg	x	6	=	-$ 120
D	+ 5 cents	x	4,000	=	+$ 200	+ 2,000 kg	x	30	=	+$ 600
					-$ 620					+$ 380
					or					or
					-$ 10.33 a ton					+$ 6.33 a ton

Net variance = -$ 240 or -$ 4 per ton

6) Trainees should not become so involved in the calculations that they forget the purpose. What conclusions should the management of the Variance Society come to as a result of the calculations, and where should they direct their attention?

- Higher than expected raw material prices have successfully been overcome by changing the raw material mix.

- Attention must be given to quality, to ensure that changes in the mix to save money do not lead to a drop in standards of quality.

- Alternative sources of ingredients A and B should be found, or existing suppliers should be pressed into reducing prices.

7) Refer trainees to the Variant Society exercise; what further information would be needed to calculate a complete standard cost of production for the animal feed?

- The information only includes the cost of the ingredients. The cost of processing must also be included.

Write the following figures on the chalkboard/OHP:

Standard costs of material = $ 132 per ton
Fixed costs of processing = $ 2,400
Expected volume = 50 tons

Allow trainees some minutes to calculate the total standard cost per ton.

Standard costs = $ 132 for material
48 for processing
Total = $ 180 per ton.

Remind trainees of the figures used earlier. What is the effect of the higher than expected volume of 60 tons?

- The processing costs will be reduced to $40 per ton, leading to a new total cost of $172 per ton.

Refer to the earlier conclusion that the volume of foods produced, crops processed or goods transported are usually beyond the control of the manager or supervisor who is responsible for the particular process or service. It is therefore vital to calculate the impact of changes in volume on total costs, in order to enable them to concentrate their attention on those things they can control.

8) Remind trainees that the standard costs and variance analyses are not primarily intended as a means of controlling, supervising or evaluating junior staff. Who should play the major role in setting standards, and who should use them?

- The managers who are most closely involved in the supervision of a particular function should play the major part in setting the standards.
- Managers can use standards to alert them when operations are not proceeding as expected. By analysing the variances, they can identify the items which merit attention, where efforts to reduce costs can be effective.

The Variant Society

The Variant Society blends poultry feed for its members. They use four different ingredients, A, B, C and D, and the standard mix for one ton of finished food is as follows:

Ingredient	A	=	500 kilograms
"	B	=	200 kilograms
	C	=	200 kilograms
"	D	=	100 kilograms
Total		=	1,000 kilograms or 1 ton

It was estimated at the end of 1983, after discussion with the suppliers of the ingredients, that the cost of raw materials during 1984 would be:

Ingredient	A	=	10 cents a kilogram
	B	=	"
	C	=	"
	D	=	30 " " "

The standard cost therefore was to be $132 per ton of feed. At the end of 1984 the actual amounts used, and the cost paid per kilogram, were as follows:

Ingredient	A	=	29,000	kilograms @	12 cents a kilogram
	B	=	13,000	"	"
	C	=	14,000	"	@ 4 "
	D	=	4,000	"	@ 25 "

Questions:

a) By how much did the cost per kilogram differ from the standard?

b) What proportion of the difference was caused by price and by usage changes?

topic

5

cost reduction in practice

SESSION 5.1

COST REDUCTION CAMPAIGNS

Objective: To enable trainees to adopt appropriate strategies for cost reduction, and to avoid inefficient approaches to the problem of excess costs.

Time: 1 to 12 hours.

Material: Case study "The Minimising Memorandum".

Session Guide:

1) Ask trainees if they have ever been involved in "cost reduction campaigns"; how effective have they been?

   Trainees may not have experienced "economy drives", "emergency cost cutting" or other similar appeals to reduce costs. The experience, if they have, is unlikely to have been favourable.

2) Divide trainees into groups of three to five members each. Distribute copies of "The Minimising Memorandum" to each trainee, and ask them to imagine that they are members of the management team that has received the memorandum. They should go through the memorandum, item by item, and decide how effective it is likely to be. If they believe that it is unlikely to be effective, they should be able to say why, and what alternative they would suggest.

3) Reconvene the groups, ask a representative from one group to present their views on the memorandum from the manager of Solidarity Society. Opinions may differ, but the instructions in the memo randum are typical, if rather exaggerated, examples of a number of approaches to cost reduction which experience has often shown to be useless or counter-productive. Specific criticisms, and suggestions, might include:

Item (a)

Criticism: Cost reduction, like any other management task, requires a team effort. The manager alone cannot examine and control every item of expenditure, and by taking it upon himself to have the sole responsibility he is effectively telling his subordinates that they are not responsible; this is unlikely to improve their performance.

Suggestion: The manager should meet individually with every subordinate. They should together go through the costs of that subordinate's operation and should agree, together, on areas where cost reduction may be made. As with standard costs, the subordinate him- or herself should suggest and agree to take responsibility for achieving a certain target.

Item (b)

Criticism: It is absurd to spend as much time on reducing the cost of items totalling only $10 or $100 as those costing several thousand dollars. Attempts to save money on postage stamps or stationery may be valuable as a way of demonstrating to all staff the need for savings, and as a way of encouraging even junior staff to suggest economies, but top management must devote attention to those items which really matter.

Suggestion: The manager should identify those items which are large and susceptible to reduction. He should in discussion agree on feasible reduction targets, and delegate responsibility for their achievement to specific managers.

Item (c)

Criticism: It is most unlikely that all costs can be reduced by ten percent. Some may be reduced by more, while others may have to be increased in order to secure greater reductions in more important ones. A blanket reduction of ten percent is thus quite im-

practical and undesirable. Attempts to implement such a programme are likely to lead to wasted effort and to decisions which may even increase losses. It is also important to remember that in the short term all costs are fixed (even casual labour cannot be dismissed without any notice) and in the long term all costs are variable (even the manager's salary can be saved if the society closes down). The time factor must not be neglected.

Suggestion: As already suggested, a cost reduction programme should focus on items which can be reduced, and which will make a significant difference to overall results. Analysis of the society's surplus account will immediately show the larger items, and very little investigation is needed to realise which can reasonably be reduced.

Item (d)

Criticism: Excessive attention on costs per item is likely to lead to low quality suppliers, which may in turn lead to higher usage and higher total costs. The people who actually use fuel and other supplies may also feel that they can shift responsibility onto the purchasing officer whose task it is to secure lower prices, rather than minimising costs by lower consumption.

Suggestion: Every significant expense item should be approached from the point of view of usage as well as price. High price suppliers may lead to lower total costs. The lowest priced item is rarely the most economical. Managers should be instructed to lower costs in total, whether through lower usage or lower prices, or through a combination of the two.

Item (e)

Criticism: Supervisors will feel that they are not trusted if they have to submit all purchase requests to the manager. They will therefore behave as if they are

untrustworthy, and will devote their time to getting round the regulation, such as by dividing large payments up into small ones. This will actually increase costs and will divert their attention from genuine efforts to reduce them. The manager's time will also be wasted, and orders for essential supplies will be delayed by the need for his signature, thus further increasing costs.

Suggestion: The manager should work with and assist his staff in their effort to reduce costs, rather than double-checking them. He should use his "bird's eye" view of the society as a whole to co-ordinate their efforts, and to prevent savings in one department from actually increasing costs in another.

Item (f)

Criticism: High costs are not in themselves a problem, unless they are not matched by proportionately higher revenue. The manager's recommendation is likely to lead to lower membership as the quality of service and recruitment efforts falls. The overall objective should not be cost reduction but surplus increase. This may be achieved by higher membership and higher revenues, which will themselves require higher rather than lower costs. The most positive way for a society to extract itself from difficulties is to adopt an aggressive and positive policy of expansion. The pressure for an immediate increase in surplus can usually be more easily satisfied, and more permanently, through expansion rather than contraction.

4) Ask trainees to reconsider the position of their own societies:

- Are they all making as good a surplus as they should?
- Have they analysed their results to see how the surplus can be increased through higher revenue and lower costs?

- Have costs been analysed in order to identify those which justify efforts to reduce them?
- Has responsibility for revenue increase and cost reduction been clearly delegated to responsible staff, who feel themselves to be part of a team?

The Minimising Memorandum

TO: Management and Supervisors, The Solidarity Society.
FROM: The General Manager.
DATE: February 28th, 1985.
SUBJECT: Costs.

You will all have heard of the serious increase in our costs, which contributed to our society incurring a loss for 1984. This is the first time our society has incurred a loss for four years. I shall need all your co-operation in my efforts to remedy this situation, so that 1985 will make a recovery, and I am putting the following steps into effect, as from today.

(a) I am taking on myself full responsibility for all our costs, and for reducing them. I know that I can count on your full support in this, and I shall be examining each department in turn in order to make appropriate reductions in costs.

(b) Every single cost item deserves our attention. I shall expect suggestions for reduction or elimination of individual cost items from all of you, and shall welcome them all, regardless of the actual amount of money involved.

(c) By the end of March 1985, every cost will have been reduced by at least ten percent. I know that this will be difficult, but we must achieve this goal if my efforts are to be successful.

(d) Every effort must be focused on <u>costs</u>, <u>costs</u>, <u>costs</u> and their reduction. I have asked the accounts department to inform the managers of each department what is the cost of every item concerned. This must be reduced, by ten percent.

(e) In order to ensure that I have full control, every purchase order for more than $100 worth of goods or services will have in future to be signed by me. I have given instructions for a special sheet

to be attached to every order over $100, on which whoever initiates the order must explain why it is necessary, in spite of my campaign. If I agree to it, I shall counter-sign the order, but I must warn you that it will only be in exceptional circumstances.

(f) I want everyone to devote his full attention to this campaign for the next three months. I appreciate that activities such as member recruitment and produce sales are important, but cost reduction must be our 100% concern for this period at least.

SESSION 5.2

ACTION COMMITMENT

Objective: To enable trainees to apply what they have learned to their own situation, to develop a solution to a specific problem with the assistance of the group and to commit themselves to its implementation by a given time.

Time: Up to one day.

Session Guide:

1) Remind trainees of the difference between the classroom experience they are just completing and the reality of co-operative management. The two may very easily become unrelated. The ambition of this course, however, is that trainees should apply what they have learned in the classroom to the daily management of their co-operative societies.

2) It is very helpful to have a "bridge" between the classroom and the societies. Remind trainees of their obligation to make an "action commitment" at the end of the course, by describing some thing they are going to do as a result of the course and by committing themselves to have reached a certain stage in its implementation by a certain date.

During the course trainees should have been continually reminded of their responsibility to make this action commitment. This final day gives them the opportunity to develop a solution to this problem, using what they have learned during the course and in consultation with a number of other trainees, and then to present the solution to the whole group for criticism and comment.

3) The time available should be divided into two periods - the consultancy period and the presentation period. During the consultancy period the trainees should be divided into groups of three to four people. The groups should not contain trainees of the same co-operative and ideally should include trainees from different

backgrounds. In this period each trainee should be allowed about 30 minutes to present his problem and proposed solution to the other members of the group, who are expected to comment and help develop a solution to the problem, together with a timetable for its implementation.

During the presentation period each trainee should have at least ten minutes to present his problem and solution to the whole group, and to hear and react to at least a few of their comments. In this brief period the trainee must:

- Describe the problem.
- Describe the solution.
- Describe how the solution will be "sold" to whoever is involved.
- State a specific date by which the plan will be completed.

Trainees who are in a position of authority in a co-operative may feel that it is unnecessary to "sell" their idea to their subordinates or to committee members. Such trainees should be warned that subordinate staff will contribute more efficiently to the work of the co-operative if they believe what they are doing is useful rather than if they do it out of fear or simple obedience.

The actual timing of the "consultancy" period and the "presentation" period will depend on the number of participants in the course. In order to ensure that sufficient time is allowed to each trainee the normal session hours should be extended or some time should be allowed during the previous day. The session is important since it provides an effective "bridge" between the course material and the normal environment of the trainees. It also ensures that the trainees regard the completion of the course not as the end of training but as the beginning of personal improvement on the job.

The problems and their solutions will of course be unique to each trainee and his organisation, but typical examples might be as follows:

- Problem:

  The supervisors always argue about who is responsible when expenses are too high, and nothing is done to improve things.

  Solution:

  By the end of June I shall have selected cost centres and I shall have designed, "sold" and installed a simple costing system based on these.

- Problem

  We have excess processing capacity at some times of the year; other organisations wish to use it but complain about the prices we charge. We dare not reduce our prices for fear of losing money.

  Solution:

  I shall within a month calculate the break-even point for the facility, at various price levels, and thus calculate an attractive but still profitable price.

- Problem:

  We can never decide when to replace vehicles or other equipment, because we do not know what it costs to operate them.

  Solution:

  I shall in three months allocate direct costs to each item, and monitor the totals, so that we can see when higher running costs make replacement more profitable.

- Problem:

  Members cannot understand why costs per unit processed increase if they sell less of their produce through their society.

  Solution:

  I shall calculate and present to members at the next general meeting a set of simple examples illustrating the effects of fixed and variable costs.

4) Trainees should be encouraged to arrange to meet each other at work after the course for continued "group consultancies". The instructor should also undertake to visit or otherwise contact each trainee around the promised date of completion of the action plan, in order to ascertain whether or not it has been implemented. It must be stressed that this is not in order to evaluate the trainees, but the training course itself.

If possible a brief reunion should also be arranged, to take place after an appropriate interval. If this can be done, trainees should be asked to state in this session exactly what they plan to have achieved by the date chosen for the reunion, so that they can on that occasion compare progress with the stated intention. This is not only a useful evaluation device, but more importantly, the public commitment and knowledge of the forthcoming reunion will be a powerful incentive to actual implementation.