MATCOM

PROJECT PREPARATION AND APPRAISAL

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
- Risk Management
- Work Planning
- Export Marketing
- Management of Larger Agricultural Co-operatives
- Cooperative Audit and Control
- Management of Multipurpose Cooperatives

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

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International Labour Office
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Switzerland

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THE TRAINING PROGRAMME

1. Target Group

Target groups for this training programme on "Project Preparation and Appraisal" are:

(i) managers or assistant managers of co-operative business federations, agricultural co-operative unions or larger primary societies;

(ii) co-operative officers in charge of development of agricultural co-operatives;

(iii) co-operative policy-makers (Commissioners, Registrars and Assistant Registrars, Secretary Generals, etc.).

2. Aim

The aim of the programme is to enable trainees to prepare and appraise ideas for development and investments ("projects") in the light of their financial and social contribution. More in particular, the training should allow the target groups on their return home:

- to formulate more and better ideas for new investments;
- to present these ideas more effectively to committees and banks, in order to increase the possibilities of raising funds and implementing the projects;
- to improve management of projects;
- to avoid unprofitable projects.

To achieve this, the programme will enable trainees:

- to identify, in a co-operative context, the need for a project;
- to select and obtain the data which are necessary for an effective project proposal;
- to make reasonable forecasts as to the data necessary for making effective project proposals;

- to present, in writing and verbally, proposals for investment;

- to select and apply appropriate methods of project appraisal, taking into account the availability and accuracy of data, the time available, the amount of money involved and the social effects of the project;

- to assess the degree of risk in various projects and to make allowances to cover or reduce such risks when appraising projects;

- to explain the link between the success of projects and the viability of members' associated farming activities;

- to distinguish the "human" from the technical and economic risk factors in any project;

- to present projects to potential sources of finance in an effective way.

3. Use

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

4. Duration

The complete programme, as described in this manual, consists of 26 learning sessions. Session times vary from 1 to 4 hours. The total programme will take approximately 60 hours, or between 10 and 12 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. A timetable should be prepared accordingly.

5. Training Approach and Methods

The programme is based on the assumption 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 home from the training programme, the trainees should therefore 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 and a built-in action commitment.

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

Every trainee, even if he or she has never actually managed a co-operative society, has some ideas and suggestions from which the others can learn; if any or all of the trainees have management experience they can contribute a great deal to the learning of the others. 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 that the knowledge that you, the instructor, or the material in itself, can contribute. If you do no more than allow every individual to put in what he knows, and to learn from what the others know, you will have achieved a great deal.

Remember that knowledge is like fire, you can share it with other people without losing anything yourself. 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 designed to help you to draw out, or "elicit" these contributions.

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

6. Structure

The programme is divided into six TOPICS and each topic is covered by a number of SESSIONS (see the table of contents on page 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 comprehensive "plan" for the session, including instructions on how to conduct the session;

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

7. Adapting the Material

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

Read through the programme and decide whether:

- the programme can be run as it 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 considerably 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 the material properly will be the amount of changes, additions and amendments you have yourself written in this copy.

8. Preparing the Training Material

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 other.

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 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 preparing 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 carefully; be sure you understand the content, and that you 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 trainee's 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 "Devils's Advocate"; 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 following 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 dyanmic, lively and active. Move around, walk up and down the classroom, and generally keep everyone alert to your physical activity.

11. After the Course

Note down each trainee's action commitment, and 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 implementing their action commitments. If they have 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.

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Pre-course Questionnaire

Name:.....

Society: .....

Job Title: .....

Brief description of your responsibilities:

.....

.....

Major problems faced by your society:

.....

.....

Major projects undertaken by your society in the last two years:

.....

.....

Major projects anticipated by your society in the next two years:

.....

.....

.....

Please complete the following sentence. "As a result of attending the course on Project Preparation and Appraisal I hope that I shall be able to .....

.....

....."

SESSION 1.1

INTRODUCTION

Objective: To emphasise the importance of effective preparation and appraisal of projects of all kinds, and to identify sources of expertise within the training group.

Time: 1 to 2 hours.

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

Session Guide:

1) If a prominent visitor is to open the programme he or she should be asked to give examples of problems which have arisen through inadequate project preparation and appraisal. The visitor should stress that people in the trainees' own positions can make a major contribution towards preparing and appraising projects more effectively. The visitor should, however, also be asked to stress that effective management of a project, after it has been approved, is every bit as important. The best prepared and appraised projects can in fact fail if they are not managed efficiently. Complete knowledge of the latest methods of project preparation and appraisal is of no value if the organisation does not generate good ideas for new projects, or if ideas for new investments are not received with interest. Project Preparation and Appraisal is a vital part of development, but is by no means the whole story.

2) Ensure that trainees are not bothered by any administrative questions. They should know where they are to stay, how they are to pay their expenses, what transport facilities are needed and any other information which is relevant.

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 doing, rather than by listening.

4) Ask each trainee to summarise his previous training and practical experience for the group, and to reaffirm what he hopes to gain from attending this course. Emphasise that everyone brings something to the course and that, if all return having shared the accumulated experience, a great deal will have been gained. Resource persons, and the material, can only provide some ideas about techniques and a structure for the course. The major input will come from the trainees themselves.

5) Stress that the objective of the course will not only be to learn how to prepare and appraise projects, but also to produce a project, and to appraise it, so that practical use may be made of this when the trainees return home.

At the end of the course trainees will have to commit themselves to a specific plan of action based on what they have learned. They will be required:

- to state a particular problem in their society;
- to describe the way in which they propose to solve this problem;
- to describe how they will "sell" their solution (i) to their superior and their subordinate staff, and (ii) to the committee and members if necessary;
- to describe exactly what they hope to have achieved by a certain specified date, within one year from the end of the course.

Trainees' success in implementing their plans will be assessed at the time indicated in their plans. The course will be evaluated according to their success.

SESSION 1.2

WHAT IS A PROJECT?

Objective: To enable trainees (i) to list the characteristics of a project, and (ii) to describe why projects require proper preparation and appraisal.

Time: 1 to 1 1/2 hours.

Session Guide:

1) Ask trainees to give examples of typical "projects" with which they have been involved. Based on these examples, attempt to elicit a definition which covers the same points as the following:

"A proposed activity whose costs and benefits can at least to some extent be isolated, and where costs must be incurred before benefits are known."

2) Trainees will probably have mentioned only major "projects", such as the construction of a new processing factory or irrigation system. Point out that the definition does not refer to the size of the project. Any single activity which involves expenditure and returns, and about which a decision must be made, is a project.

3) Ask trainees where they would expect to obtain the funds to be invested in a project. They will probably refer to sources of funds outside their own society.

Ask trainees to state in what ways the appraisal of a project should differ:

- if the funds for the project are obtained from outside;
- if the project is to be funded from the society's existing internal resources.

4) Trainees' answers may imply that externally funded projects require more detailed appraisal, because the bank or other source

of funds will require detailed analysis before granting a loan, and will wish to supervise the use of the loan.

5) Ask trainees how a society's internal resources have been obtained. Any resources of a co-operative society belong to its members. Even if by-laws prevent distribution of surplus beyond a certain amount, the officers of a society should treat the society's funds as if they were on loan from members. Any proposed investment must therefore be treated as if members had to be asked to lend money for it.

6) Ask trainees to name the kind of resources which are invested in projects. They will refer to money, but other resources, such as equipment or space, and <u>time</u> (managers' and other people's), must be allocated as carefully as money.

7) Ask trainees what "project" they are presently engaged in. Point out that their present "training" represents a commitment of time and money, in return for unknown future benefits. Allow trainees up to ten minutes to list (i) the costs their society has incurred and (ii) the possible benefits that it hopes to gain as a result of their attendance on this course.

8) The <u>costs</u> of training include:

- any fees payable;
- any expenses for travel or accommodation;
- the value of what the trainee would have done for the society if he had not been on the course;
- the cost of any preparation the trainee had to do before the course;
- the cost of any mistakes that the trainee may make as a result of attending the course.

Ask trainees to estimate the total cost to their society of their attendance. They should do this by putting a figure to each cost item. Trainees will probably use their own salaries as the figure for the cost of their absence. Ask trainees why this could be considered as a "minimum" figure. Elicit the following:

- Overheads (accommodation, transport, secretarial facilities), incurred by each society in association with the employment of each individual, should be added to the total training cost.

  Example: A manager of a society leaves for a two-week training course. It is very unlikely that his secretary will be able to work like she does when he is there. I f she is not given any other tasks, she may even do nothing for two weeks. Her cost to the society during these two weeks should therefore be looked upon as part of the investment the society is making in the training of its manager.

- A society will earn a surplus only when each individual staff member makes sure that what he costs his society (salary, fringe benefits, etc.) is less than what he contributes in terms of benefits to the society. To be worth employing, a person should earn benefits greater than his salary. The investment a society is making in a person's training is therefore equal, not to his salary, but to what he is really contributing to the society in terms of benefits.

If the training course is subsidised so that societies do not bear the full cost, estimate the amount of subsidy, from domestic or foreign sources, which should be allocated to each trainee. Add this to the total cost.

9) Ask the trainees how else their societies might utilise the money now being spent on their training. Show that if their training is to be worthwhile, the benefits resulting from it must be greater than:

- the total cost involved in their training;
- the benefits which might have resulted from any alternative use of the same money.

These rules apply to all projects, hence the need to prepare and appraise projects correctly.

10) Ask trainees to read from their lists, the benefits their societies may expect in return for the investment in training.

These are far more difficult to list and assess than the costs. Benefits expected from a course on Project Preparation and Appraisal might be listed as follows:

- the society should have more and better ideas for new investments;
- the ideas will be presented more effectively to committees and banks, so that there will be more chance of funds being made available to implement them;
- the risk of undertaking unprofitable projects is likely to diminish;
- projects which are undertaken should be better managed, and more likely to achieve their objectives.

In order to decide whether someone should attend a course, these benefits should be compared to the costs. They can also be used to evaluate the course at a suitable time after it has been completed. Training projects are the most difficult of all to appraise. However, each society, and every trainee, should be aware of the fact that <u>training does cost money</u>. Unless the return from the training exceeds what might have been earned by using the money in some other way, the training will have been a bad investment.

11) Show that everything a manager does in a society involves spending money (including the cost of his own time). From 9) and 10) above it is clear that the return from this spending should not be less than alternative ways of spending the same time or money. "What a manager should do, and how he should spend his time" should therefore be looked upon as a "project", and any decision on it must be taken in the same way as a decision about investing large sums of money in a large project.

Ask trainees to describe the sort of decisions they make every day. These may include:

- Should I go and visit some members' farms today, or should I stay and deal with the correspondence in the office?

- Should we recruit a part-time labourer to work in the stores during the busy two-week period, or should we try to manage with the existing labour force?
- Should I order 500 or 5,000 sheets of writing paper?
- Should I recommend that the chairman cancel the next committee meeting since there are not many items on the agenda?
- Should the society's only vehicle be used by the stores manager to collect some badly needed supplies, by the education officer to carry his equipment to a course, or by my wife to visit the clinic?

Clearly, decisions of this sort do not justify a presentation and detailed appraisal, but the manager must still think in terms of the benefits to the society, and the costs that will be incurred. This is a matter of attitude and not technique. Managers may approach decisions with a number of questions in mind:

- What will be the easiest thing to do?
- What will I enjoy the most?
- What will keep the staff and committee happy?
- What will look best in the eyes of my superiors?
- What will benefit the society the most, in relation to the costs of doing it?

Only the last question should be considered.

SESSION 1.3

PROJECT IDENTIFICATION

Objective: To enable trainees to identify investment opportunities.

Time: 1 to 2 hours.

Material: Tape Dialogue "The Agrarian Farmers' Society".

Session Guide:

1) Inform trainees that they are about to hear a few moments taken from a typical day in the life of Joe Egesi, secretary of the Agrarian Farmers' Society. They should write down, as the dialogue proceeds, every problem which they identify.

2) Play, or enact the tape dialogue, and repeat it if trainees want that. Ask trainees to give their suggestions and make up as long a list as possible on the chalkboard/OHP. The list might be as follows:

- More typing capacity.
- Better accounts staff.
- A secure warehouse.
- A single warehouse.
- A covered vehicle parking place.
- A stock of vehicle spares.
- Improved ploughing facilities for members.
- Improved flow of water in irrigation canal.
- Farmers to be educated on the use of fertilizer.
- Provision of cotton ginning facility.
- New rice storage facilities.

3) Ask trainees, individually or in groups, to suggest ways in which each of the problems could be solved. Allow up to 30 minutes for this. Encourage trainees to think beyond the obvious solutions and to suggest others which might be equally effective, and possibly less expensive.

4) Reconvene the group and ask for suggestions for each problem. There will inevitably be lots of ideas. However, the objective at this stage is not to analyse or select, but to produce as long a list as possible. A suggested list might be as follows:

Typing Capacity

- Write letters by hand.
- Write fewer letters.
- Buy an electric typewriter in exchange for the existing manual typewriter.
- Buy a new manual typewriter in exchange for the old one.
- Hire another typist and provide him, or her, with a new typewriter.
- Replace the existing secretary.

Accounts Staff

- Send the existing clerk for training.
- Send the manager for training.
- Hire a new accountant.
- Hire the part-time services of an outside professional accountant.

Warehouse Problems

- Rebuild or extend one of the two existing warehouses.
- Buy/rent/build new premises.
- Re-organise the stock to make better use of existing warehouses.

Vehicle Parking

- Buy a plastic or cloth tarpaulin, or engine cover.
- Buy/rent/build a garage.
- Put the vehicle in a covered space, which is available, but used at present for some other purpose.

Vehicle Spares

- Purchase a stock of frequently used spares.

- Encourage a local stockist to keep the necessary spares.
- Replace parts regularly, rather than waiting for them to fail.

Ploughing

- Design and introduce new systems, which would allow more time for ploughing between harvest and sowing.
- Encourage greater use of ox ploughs.
- Start a tractor hire service.
- Finance members' use of an outside tractor hire service.
- Encourage and assist farmers to buy small two-wheel tractors.

Irrigation Canals

- Encourage farmers to grow crops which require less water.
- Ensure that the available water is shared more evenly.
- Enlarge the existing canal.
- Bring the water from some other source to the farmers at the extreme end.

Fertilizer Education

- Accept supplier's suggestion for joint promotion and training.
- Obtain lower cost suppliers, and cut the society's margin, to encourage greater use of fertilizer.
- Ask extension staff of Ministry of Agriculture to educate farmers.
- Distribute leaflets and posters.

Cotton Ginnery

- Set up a joint ginnery with other societies, as suggested.
- Set up a ginnery and sell services to other societies.
- Discourage members from growing cotton.
- Make arrangements with other private, or co-operative ginneries, to gin members' cotton.

Rice Storage:

- Construct a new bin.

- Ask farmers to delay their deliveries, and to store their rice on the farms.
- Ask the mill to accept earlier deliveries.
- Hire storage space from local contractors.

5) When a wide range of alternative solutions has been put forward, ask trainees whether a similar list could be produced for the same or similar problems existing in their own societies. They will probably agree that it could. What prevents the improvements from being put into effect?

6) Trainees may suggest that finance is the problem. They may imply, if funds were available, lists of this sort would no longer exist because all necessary improvements would have been made. Ask trainees how many detailed investment proposals they have submitted during the last twelve months.

Ask trainees what Joe Egesi is likely to do about the problems in his society. He will probably <u>do nothing</u>! Is the main reason the shortage of funds? Most development and co-operative bankers, at all levels, say that their main problem is <u>not</u> the shortage of money to lend to good projects, but a shortage of good, properly presented projects to lend money to. Reaffirm this fact by reference to local bankers if possible. The foregoing exercise, and trainees' own experience, suggest that there are a lot of things that need to be done. Many of these require funds, and all of them can potentially benefit societies and their members. What is then lacking?

7) Encourage discussion at this point. Elicit from trainees the following sequence of activities which Joe Egesi, or any other co-operative manager, might undertake in order to get things done and to solve problems.

a) Identify problems clearly. (Point out that many managers waste a lot of their time solving the wrong problem.)

b) Identify possible alternative solutions to each problem.

c) Obtain as much necessary economic data as possible about the solutions (including information about the present situation, since doing nothing may be the most economic solution).

d) Define clear and, if possible, quantify the costs and benefits associated with each possible solution.

e) Present the alternatives in a manner which enables them to be compared (i) with each other and (ii) with possible solutions to other problems; this will allow the manager, or whoever else is responsible, to decide on the best one for the society's resources.

f) Manage the implementation and operation of the chosen proposal, so that it will achieve the benefits estimated at the outset, and thus fully justify the resources devoted to it.

8) All co-operative management training is concerned with the last activity (f). This course is concerned with the first five activities (a, b, c, d and e).

Tape Dialogue : The Agrarian Farmers' Society

Narrator: Joe Egesi is the manager of the Agrarian Farmers' Society. The society has about 300 members, most of whom grow rice as their main crop. The society operates a hul ling mill, and markets members' surplus rice to the State Marketing Board. It also manages the irrigation system which was taken over by the community when the foreign land-owners left, and their farms were sub-divided. The society runs two lorries to collect farmers' crops and deliver farm inputs. The manager's job is difficult: he always seems to be "fighting fires" rather than looking ahead, and as Joe came into his office on Friday, July 24th it started like any other day.

Joe: Good morning, Mary. The in-tray looks as full as ever. Have you typed those circulars yet?

Mary: I'm sorry, but our typewriter is so slow. There's another circular in the mail about these electric machines - I'm sure that one of those would solve all our problems.

Joe: So would a million dollars. But let's have a look at the morning mail. Mmm (Pause) Mmm Good lord, 15 hundred dollars to insure the warehouse, that's far more than we paid last year, I'm sure. Oh, Mmm, I see. They say the old place is too full, is a fire hazard, and easy for any burglar to get into. We'll just have to pay I suppose.

(Telephone rings)

Hello, Joe Egesi here.

Voice: This is the District Co-operative Audit Officer. We still haven't received your accounts for last year.

Joe: I know, I've just seen your reminder in the mail. I'm very sorry, but the lad in our accounts department does not really know about accounting, although he's bright. I'll try and do it myself.

Voice: All right, but the accounts must be with us by the end of August, otherwise questions will be asked.

Joe: Fair enough, I'll do my best. (Puts telephone down) How I'll do it, I don't know. I don't understand all this assets and liabilities stuff myself really. Now (Pauses) Mmm What's this? Mmm, Oh yes, last week's report from the field officers. Looks like the same old problems. Farmers say they could not plough their fields properly in time, so there will be lower yields again. Still, maybe it's as well. The old rice mill cannot really cope with a proper crop.

Mary: Excuse me, will you want the landrover today?

Joe: No, I don't think so, why?

Mary: Well, the driver says it won't start. The engine got wet in the storm last night, and he needs new spark plugs. And you know it's twenty kilometres to town to get them.

Joe: Tell him I've got to go out tomorrow, so he'd better have it working by then. Oh, Mary, do you know anything about the group of members who want to see me this afternoon? What's it all about?

Mary: They're from the far end of the old plantation. I think they want to complain about the irrigation canal. Hardly any water reaches their end, they say, and the new varieties need more water.

Joe: Oh yes, I remember they had that trouble last year. Well, they'll just have to put up with it. Now, I'd better look at the rest of the mail. Oh, at long last, an answer from the Cotton Marketing Board, Mmm, Oh yes (Pause) I see, there's no ginning capacity. They suggest that we get together with some of the other societies to build a ginvery, and then they'd buy our cotton. Gosh, they don't know what they're asking!

(Telephone rings)

Yes, Joe Egesi here.

Voice: It's Bill Okot from Fertilizer Supplies here.

Joe: Hello Bill, what can I do for you?

Voice: Well, a couple of things. First, please tell someone to make it clear to us where we are to deliver things. One of our drivers said he had unloaded half his goods at your warehouse and the storeman suddenly said it had to be taken to your other place. It took him nearly all day to load the stuff up again and take it back to the other store.

Joe: I'm sorry, it causes us all kinds of problems, having to divide our stocks between two places, but we just can't afford to build a big new warehouse. I'll try to make sure it doesn't happen again. Thanks for letting me know, anyway.

Voice: That's O.K. Now, the other matter. Our market research people did a survey of farmers' awareness of fertilizers, and I've just had the results. The farmers around here, including yours, appear to know even less about fertilizers than most farmers in the country.

Joe: I'm not really surprised, they're not the most up-to-date of people.

Voice: Our prices to you don't allow for much help with publicity, but why shouldn't we get together and set up some demonstration plots, have some meetings, and so on? We'll provide fertilizer free of charge for the plots, and I could speak to the members once or twice. How about it?

Joe: Not a bad idea, but it would cost a lot. I'll have to think about it. Thanks for the suggestion, though.

Voice: Well, I hope it'll be of some use. Goodbye.

Joe: Goodbye.

Mary: Excuse me, would you sign this local purchase order for the driver so he can get the spark plugs. He also wants to pick up those draw bars that are being welded. He's not sure of the price, but apparently it costs almost as much as a welding kit itself.

Joe: Exaggeration I suppose. We must be spending a fortune with these welding people; there's always something broken. Here you are. (Pause) Mmm, now what's here? Oh dear, a reject note from the rice board. They've down-graded our last delivery from Grade B to Grade D. They say that broken grains and dampness are to blame. I'd never thought we'd get away with the B grading but it's always worth trying. We'll just have to accept gracefully and try again next time. The problem is that rice just can't be stored properly outside. What we really need is a bin.

SESSION 1.4

PROJECT SCREENING AND PRIORITIES

Objective: To enable trainees to decide on an order of priority for the project possibilities which are open to their societies.

Time: 1 to 1 1/2 hours.

Session Guide:

1) Ensure that all trainees have a copy of the list of problems and possible alternative solutions as agreed in the previous session.

2) If some time has elapsed since the last session, replay or enact the dialogue of Joe Egesi to remind trainees of his attitude and the problems facing him. Ask trainees what they would expect Egesi to do about the problems that have been identified. Like many managers, he appears to be mainly preoccupied with "fighting fires" rather than attacking the causes of problems. He'll probably do nothing about many of the problems, until total breakdown or other pressures force him into doing something quickly. In many cases that may not be the best course of action in the long run.

3) It is easy to criticise Egesi, but it takes a great deal of time (i) to investigate each problem, (ii) to define alternative solutions and (iii) to assess the cost and likely benefits of each alternative. The manager cannot possibly investigate all of these problems at the same time. The result may be that none of them is dealt with.

   Ask trainees if this is a wholly false situation. What must Egesi do in order to start dealing with all his problems?

4) Clearly Egesi must decide what possibilities to investigate first, and whichlast. He must set priorities. Ask trainees to suggest what criteria should be used for this purpose. They may suggest availability of funds.

Remind them of the banker's view that funds are available for any good projects. Funds are only one factor and possibly not even the most important one.

The aim of setting priorities is to decide which projects should be investigated. Ask trainees whether it is necessary to investigate each project in detail for this purpose.

Elicit from trainees those criteria which will normally suffice to decide where a project should be in order of priority. They should include:

- Simplicity of assessment and management.
- Urgency.
- Attraction to members.
- "Linkage" with other problems, or side effects.
- Amount of money required.

5) Divide trainees into groups and ask them to produce a priority list for Joe Egesi's ten projects, using the above criteria. Point out that groups can give more importance to any criterium they feel should be weighted. Allow up to 40 minutes for this.

6) Reconvene the group and compare their priority lists. The objective is not to discuss differences of opinion (which will depend on assumptions and participants' previous experience). It is to show that priorities can, and must be ranked in order of importance, if the task of project preparation and appraisal is to be manageable.

A possible, very simplified, priority list for starting work on the projects might look like the one shown on the opposite page.

Problem	Urgency	Simplicity	Member Attraction	Side Effects	Ease of Finance	Total
Typing	1	1	3	1	1	7
Accounting	1	2	3	1	1	8
Warehouse	2	2	1	1	3	9
Vehicle Spares	2	2	3	1	1	9
Fertilizer Awareness	3	2	2	2	1	10
Vehicle Parking	3	1	3	3	1	11
Rice Mill	3	2	2	2	3	12
Ploughing	3	3	1	2	3	12
Irrigation	3	3	2	3	3	14
Ginnery	3	3	2	3	3	14

1 = High
2 = Average
3 = Low

7) According to this method, without any weighting, the priority areas show up in the order listed.

Ask trainees to suggest the dangers of ranking systems of this sort.

- Urgent problems with inexpensive, simple solutions will always be investigated first, so that more long-term and ambitious projects are never dealt with.
- Projects which are desperately urgent, or very simple, may be neglected because of poor rating according to the other criteria. How can this be avoided?

8) A system of this sort must be used as part of an effective management procedure, and with some flexibility. It could be put into effect like this:

- At the beginning of each year all projects should be rated. A time should be set for investigating each of them, with some order of priority. The timetable should not be changed except for desperately urgent cases, which may need to be implemented without any investigation (e.g. motor breakdown, dealing with disease attacks, etc.).
- The ranking system should be used flexibly. Any apparently un-acceptable results should be re-appraised, for example, if the rating gives a low decision for an obviously urgent project, or a high decision for a project which is obviously not of prime importance.

9) Remind trainees that the scarcest resource in most co-operatives is the time of good managers. A system such as above is one way of making a better use of,this resource, and with the ability to apply it, trainees will gain on this course.

topic

2

data requirements

Session 2.1 Data Identification

Session 2.2 Data Sources

Session 2.3 Obtaining Data

SESSION 2.1

DATA IDENTIFICATION

Objective: To enable trainees to identify the data needed as a basis for project preparation.

Time: 1 to 12 hours.

Material: Case Study "Joe Egesi's Problems".

Session Guide:

1) The purpose of project appraisal is to reduce the chances of wasting resources by investing in projects which do not yield a satisfactory return. Project appraisal aims to improve decisions about action to be taken in the future.

2) Ask trainees how they can obtain information about the future. Illustrate that actually, this is impossible. The manager can only obtain information about past and present facts, and about future intentions, and from this he can make some estimate of likely future facts.

Projects cannot be prepared until all the necessary estimates about future costs and benefits have been made. This involves several stages.

- Deciding what information is necessary.
- Deciding how the information is to be obtained.
- Obtaining the information.
- Estimating the future project costs and benefits, on the basis of the information gathered.
- Appraising the project, i.e. deciding whether the project is worthwhile.

This session is concerned with the first stage of deciding what information is necessary.

3) Briefly describe each of the following situations to trainees. After each description, ask trainees to identify the type of information which was missing.

a) A co-operative society purchased a new crop processing machine. It was supplied and installed for the quoted price, but it was unable to handle a particular variety of crop grown by members. It broke down repeatedly, and ultimately had to be scrapped.

(Technical information about equipment was lacking.)

b) A co-operative society purchased a vehicle for the quoted price. However, the nature of the terrain resulted in a fuel consumption which was far higher than estimated. This upset the economics of the whole project.

(Financial information about operation was lacking.)

c) A co-operative society installed new equipment to process members` increasing production of a certain crop. Everything functioned as planned, except that the crop price fell drastically, members lost interest in the crop, and the equipment became redundant.

(Financial information about output was lacking.)

d) A co-operative society encouraged its members to grow tea and invested in vehicles to carry the tea to the factory. It was found, however, that the tea could not be transported quickly enough to the factory, and so it deteriorated.

(Technical information about output was lacking.)

4) Ask trainees to suggest the various types of information that are required, based on the above **situations.**

	Equipment	Operation	Output
Financial	X	X	X
Technical	X	X	X

The distinction between these types of information may not always be clear-cut, but a table like the one above may help avoid omissions such as described in the examples.

5) Remind trainees of the previous session and Joe Egesi's problems. Distribute the case study. Form groups. Allow groups up to 45 minutes to list all the information required. If time allows, each group should complete the list for each project. Otherwise each group may be given one or two projects only.

6) Reconvene the group and list their information. Avoid repetition or lengthy discussion about whether one item is the same as another. The objective is to demonstrate how much information is necessary - or at least desirable - and to produce a basis for the following session dealing with sources of information. A possible listing is as follows:

Typing

A - Cost of electric typewriter.

B - Possibility of hire purchase of an electric typewriter.

A - Increase in output possible with an electric typewriter.

B - Selling price of old typewriter.

B - Extent of existing overload.

A - Maintenance cost of electric typewriter.

B - Life of electric typewriter.

B - Quality of electrically typed work.

A - Wages and associated costs of typist.

B - Life of a manual typewriter.

B - Maintenance cost of a manual typewriter

A - Output of average manual typist.

A - Projected growth of typing load.

A - Availability of spares for electric typewriter.

A - Cost of furniture for new typist.

A - Reliability of electricity supply.

B - Cost of electricity supply.

Vehicle Supplies

B - Frequency of breakdown (which could be avoided if spares available).

B - Frequency and cost of visits to town specially to obtain spares.

A - List and cost of spares most frequently required.

B - Estimate of annual use of each spare.

B - Estimate of likely future price increases of spares.

B - Estimate of likely future unavailability of spares.

Tractor Hire

A - Cost of tractor purchase,

A - Possibility of hire purchase.

B - Life of tractor.

A - Annual maintenance cost of tractor.

A - Tractor driver's wages and associated costs.

A - Cost of hire of private tractor.

A - Number of members needing ploughing now.

A - Ploughing capacity per hour of tractor time.

B - Likely increase in ploughing demand, if service available.

A - Members' willingness to pay for tractor hire.

A - Likely reliability of private service.

A - Extra crop yield likely from improved ploughing.

B - Present price for extra crop yield.

B - Likely future price for extra crop yield.

A - Consumption of tractor fuel.

A - Present and likely future price of tractor fuel.

A - Alternative uses for tractor when not required for ploughing.

7) Ensure that trainees understand the reasons for including each item, and that they themselves can justify the inclusion of any additions. Emphasise that in order to appraise any proposed pro ject, it is necessary to estimate the difference between (i) what will happen if the proposed project is implemented and (ii) what will happen if the proposed project is not implemented, i.e. if nothing is done and the situation is left as it is.

Joe Egesi's Problems

The Agrarian Farmers' Society had a lot of problems. Joe Egesi, the secretary, presented a list of possible improvements to the committee, and was told to examine the shortage of ploughing capacity more closely. The agenda for the meeting was handwritten, and Joe himself was late. When he explained that it had not been possible to have the agenda typed in time, and that he had been stuck in the field because his vehicle did not carry a spare fuse, the committee told him to work on these problems as well.

Joe had already listed a number of possible ways of solving the problems. He examined them more closely, and made a few enquiries, narrowing down his possibilities to the following:

1. Typing
   a) Buy an electric typewriter.
   b) Hire an extra typist to use an existing spare manual typewriter.
2. Vehicle Spares
   a) Purchase a small stock of essential spares.
   b) Carry on as at present.
3. Ploughing
   a) Start a tractor hire service.
   b) Farmers to make use of a recently established privately owned firm.
   c) Carry on as at present.

Joe realised that it might not be possible to implement all the proposals. He decided that the first thing he should do was to list all the information he would need to obtain before trying to compare the proposals.

Assignment:

1. List all the information which Joe will need for each proposal, in order to present and appraise each project.
2. Beside each item of information indicate whether it is essential (A) or desirable (B) when it comes to making the decision.

SESSION 2.2

DATA SOURCES

Objective: To enable trainees to identify the sources from which the data necessary for project proposals can be obtained.

Time: 2 hours.

Material: Lists prepared in previous session.

Session Guide:

1) The previous session illustrated the large quantity of data required for investment proposals. Sophisticated techniques of presentation and appraisal are of no value if the data on which they are based are unavailable or misleading.

As a first step, this session will deal with:

- the types of data or information that are needed before a project can be prepared and appraised;
- the possible sources of different types of data or information.

Next session will concentrate on using the collected data and information for assessing future values of items such as input costs, produce prices and wage rates.

2) Projects lead to change. Project appraisal therefore involves comparing two situations:

- the situation as it will be when the investment has been made;
- the situation as it will be if the investment is not made.

The second situation will not necessarily be the same as the present. (Ask trainees to explain why.) We must find out what is happening now, in order to forecast what will happen, with or without the project.

3) It is difficult to estimate what will happen in the future. It is often nearly as difficult to find out what is happening now. Ask trainees to examine the list of information required for the typewriter proposals. Ask them how they would find out the extent of the existing overload on the typing capacity.

Trainees may make the following suggestions:

- the number of letters still not typed at the end of each day;
- the number of letters never even dictated or drafted because the writer is aware of the overload;
- the number of telephone calls, handwritten messages or other methods of communication used when typing would have been more effective.

Ask trainees if it is possible, or practical, to measure any but the first of the suggestions in order to produce a meaningful statement of the extra typing capacity required.

4) Apart from being difficult, the task of obtaining existing information may show that the problem is not what it seemed to be. Ask trainees to suggest alternative explanations for the typing, vehicle breakdown and ploughing problems, which would not be solved by the suggested projects.

Typing

- Poorly supervised typist.
- Typing workload poorly scheduled.
- Poorly trained typist, whose work requires retyping.
- Typists not sharing their workload.

Vehicle Spares

- Inefficient maintenance.
- Bad treatment of the vehicles.
- Spares in chronically short supply.

Ploughing

- Farmers not using the existing ploughing method effectively.
- Farmers using the wrong seed varieties.
- Existing tractors, privately owned or belonging to contractors, breaking down and not being used efficiently.

These and similar possible situations might only be disclosed by the search for the information needed to appraise the proposed investments.

It is clear that the solution to these situations lies in improved management and not in investment.

5) Ask trainees to examine the list of information required for the tractor hire service proposal. Ask them to mark each item of information as follows:

1 = Known now and easy to obtain.

2 = Known now but difficult to obtain.

3 = Depends on the future actions of members or other people.

4 = Requires forecast based on today's figures.

Allow some 15 to 20 minutes for this exercise. The list may read as follows:

- Cost of tractor purchase = 1
- Possibility of hire purchase = 1
- Life of tractor = 2 or 3
- Maintenance cost of tractor = 2
- Tractor driver's wages = 4
- Cost of hire of private tractors = 1
- Number of members needing ploughing now = 2
- Ploughing capacity per hour of tractor = 2
- Likely increase in ploughing demand if service available = 3
- Members' willingness to pay for tractor hire = 3

- Likely reliability of private service = 3
- Extra yield likely from improved ploughing = 2
- Present price for extra crop yield = 1
- Likely future price for extra crop yield = 4
- Consumption of tractor fuel = 1
- Present cost of tractor fuel = 1
- Future cost of tractor fuel = 4
- Alternative uses of tractor = 2

This assumes that tractors are being used for similar purposes elsewhere, so that there is some experience available. This may not always be the case.

Emphasise that:

- Most information about the future is a matter of relating members' stated intentions today to their future actions tomorrow. Quantitative forecasts, based on existing data, are <u>not</u> sufficient and will very often be misleading. Ask trainees, for example, whether it would be correct to assume that, because 100% of the members have stated that they will use a certain service when it is introduced, they will in fact do so.
- Most information about the present is difficult to obtain.

6) Ask trainees how they would obtain the items of information marked with a "2" or a "3" in the above list. What sources would they contact? Possibilities are as follows:

- Tractor life : manufacturer and other users.
- Maintenance costs : manufacturer and other users.
- Number of members needing ploughing : AGM, survey and members' crop records.
- Ploughing capacity per hour : manufacturer and other users.
- Likely reliability of private tractor hire service : the owner and other users.

- Extra yields likely : other users and Ministry of Agriculture.
- Alternative uses . manufacturer, other users and discussion with members.

7) Ask trainees whether these sources of information will be unbiased or not. Which items might be subject to distortion and how might this be overcome?

- Manufacturer: is likely to exaggerate the "benefits" of buying a tractor, since he wants to sell.
- Other users: may not know, may be afraid of competition, or may be working in different conditions.
- AGM: not a representative sample of members, and politically distorted.
- Members: difficult and time consuming to survey, and present intentions may not equal future actions.
- Owner of private tractor hire service: will exaggerate reliability as he wishes to sell his service.
- Ministry of Agriculture: data may not be available, or may be based on different conditions.

No single source of information is perfect. In an attempt to assess the most likely outcome, the manager must obtain data from as many sources as possible and allow for inaccuracies and distortions.

Point out that the time and effort spent on obtaining information must be related to the amount of money to be invested. It is not worth spending $100 worth of time and effort to discover whether or not to invest $50 in vehicle spares.

SESSION 2.3

OBTAINING DATA

Objective: To enable trainees (i) to design and carry out surveys into members' likely future use of facilities and (ii) to interpret the results from such surveys.

Time: 3 to 4 hours.

Material: Role play briefs and sample questionnaire.

Session Guide:

1) Facilities provided by a co-operative society can only be economic if they are fully used by the members. Members should however be allowed to use the services of their society voluntarily and not because they are compelled to. In other words, members will use the services of their society only when they are the best and most economic available.

Ask trainees to suggest what this implies when estimating how much use members will make of facilities which are under construction.

It cannot be assumed that all members will use the facilities. Questions like these should be posed:

- How many members will make use of the facilities at the beginning?
- How long will it take for less progressive members to join in?

When trying to find answers to such questions, a society's management must estimate usage not on the basis of what they believe to be good for members, but what members themselves are likely to believe will be good for them.

2) Ask trainees to suggest sources of information which could help provide answers to the above questions.

- Management of other co-operative societies, which have installed similar facilities, may be asked to share their experience.
  (But the people and conditions will not be the same.)
- Equipment suppliers may have information from previous installations.
  (But they will be biased in favour of making a sale.)

How can members' views be obtained?

- The committee can talk to members.
  (But committee members tend to be more progressive than average and may unconsciously distort other members' opinion in favour of new investments.)
- The proposal can be discussed at the Annual General Meeting.
  (The timing may not be convenient. Members may be influenced by articulate proponents of one opinion and members attending an AGM are not usually a representative sample of the whole.)
- The manager himself can talk to members as he meets them, and attempt to judge from such conversations the likely reaction to the proposed new facility.
  (This will not necessarily provide a representative view of the whole membership.)

3) Ask trainees for a more systematic method to find out members' intentions.

- If trainees are totally unfamiliar with sampling and survey techniques, explain how a small sample can reflect a whole group fairly closely. Show by selecting a random sample from the class that a small proportion of a larger population usually gives a fair picture of the whole. For example, the total class numbers 30 and approximately half of them had eggs for breakfast. The chances are that when we select a sample of say ten, five of these ten are likely to have eaten eggs for breakfast.
- Ask trainees to suggest how a representative sample of members might be put together.

Example: Total membership 300, of which

- 120 members or 40% need extra large ploughing effort,
- 120 members or 40% need normal ploughing effort,
- 60 members or 20% need no ploughing effort.

A group of 30 members will be surveyed to assess potential demand for a new tractor hire service. Ask trainees how such a group (or sample) should be composed in order to be representative. Let them choose between following alternatives (write on chalkboard/ OHP)

	Composition of Sample		
	Members needing large ploughing effort	Members needing normal ploughing effort	Members needing no ploughing effort
Sample 1	12	12	6
Sample 2	30	-	-
Sample 3	15	15	-
Sample 4	10	10	10

Clearly "Sample 1" is the only acceptable one, since otherwise the result from the sample would not represent the situation of the total membership.

Sample 2: conclusions from such a sample are bound to indicate a very high potential demand from the whole membership.

Sample 3: will wrongly show that all members will benefit from the new service, whereas in reality 20% are not likely to use the service.

Sample 4: results will be based on the indication that two members out of three (66%) will be able to use the new service; this is rather pessimistic as in reality 240 members out of 300 (80%) could possibly benefit from the tractor service.

- Without going into sampling theory or levels of confidence, it may be appropriate to suggest that a random sample of between thirty and forty can, in most cases, give a rough picture of a situation of a population.

4) Select five trainees to play the roles described in Handouts IA, 1B, 1C, 1D and IE. Nominate one to play each role and ask them (i) to "think themselves" into their roles and (ii) to decide how they will react to any effort that may be made by the society's management to obtain their views. Ensure that these trainees are not in contact with the remainder of the group, nor with one another until the questioning procedure described in 6) below.

5) Distribute Handout 2 to all remaining trainees. Divide them into groups of five members each, and allow them up to 45 minutes to prepare their questionnaires. Provide carbon paper or other copying facilities as required.

6) Arrange a timetable so that each group has an opportunity to interview each "member", using the questionnaires they have prepared. Only one representative from each group must carry out the actual questioning (the others may observe or analyse the final results). Ensure that the interview timings are strictly adhered to, and that each interview does not last more than five minutes. Make sure that all groups carefully record all the answers received to their questions.

7) Ask each group to analyse the results of the five interviews which they conducted in order to find out:

- what changes (if any) should be made to the questionnaire and interviewing procedure, before proceeding to the main survey?;
- what the conclusions of the wider survey may be (assuming the results from the sub-sample could be used as an indication).

Allow up to 45 minutes for this.

8) Reconvene the group. Ask each group to present its revised questionnaire, briefly explaining, where necessary, how it should be administered. Lead the discussion on the following points:

a) A questionnaire should be designed to encourage a serious response, without frightening members. (Answering certain questions may give members a feeling of committing themselves.)

How can this be done?

- Omit names from questionnaires.
- Questions should relate to members' past and present situations. Conclusions about their likely future intentions can be drawn afterwards from the answers.

  Examples: How did you plough your fields last year?
  How do you intend to plough your fields this year?

- No questions about hypothetical future events.

  Example: How many tractor hours would you use if the co-operative provided a tractor hire service?

  A question like: "Would you use a tractor service if it were to be provided by the co-operative?" should come in at the end of a questionnaire. In that way earlier responses are not affected by the thought that a co-operative tractor service is likely to be started.

- Avoid "leading" questions which suggest answers.

  Example: Would you react positively if the co-operative started a tractor hire service?

  Members are sometimes unwilling to say no and will answer yes to any question which requires only a yes or no answer.

b) Members do not usually regard surveys very seriously. How can they best be persuaded to give time to answering survey questionnaires and how can their interest be gained and kept?

- Initial questions should relate, not to any proposed service, but to the members' own problems. Information received about members' problems will also help to determine members' future behaviour.

  Example: What are your major farming problems?

c) Questions can be phrased to elicit specific, brief answers which can be quantitatively analysed. Alternatively they can be phrased to leave room for discussion. This takes longer, and is less specific, but may provide a better picture about future intentions.

- If the interviewer is familiar (i) with the people he is interviewing, (ii) with the problems, and (iii) with the details of the proposed solution, then the questions may be treated as a guide only.

  The interview will become more of a "guided conversation" with the questions helping the interviewer to guide the conversation in the direction wanted.

- Specific, brief and quantifiable answers are preferable when (i) the interviewer is less experienced and (ii) the sample is fairly large.

9) Attempt to evolve a questionnaire which is generally acceptable to all trainees. Stress again the importance of short, specific and easy to understand questions, which relate to the basic informa tion needed. A possible simple questionnaire might be as follows:

Code number: .....
Hectares farmed: .....
What are your major farming problems? .....
.....
.....
How did you plough your fields last year? .....
.....
.....
How do you propose to plough your fields this year? .....
.....
.....
Would you use a tractor hire service if it were to be provided by the Agrarian Farmers' Society? YES/NO

10) Ask groups to state what the conclusions of the wider survey may be, assuming for the moment that the results from the sub-sample could be used as an indication.

Their responses may differ according to trainees' interpretation of the farmers' responses. Two alternatives might be as follows:

a) No interpretation of the responses are taken at their face value: A will use, B will use, C will not use, D will not use and E will not use.

i.e. 40% will use.

b) Interpretation of the responses based on the personality of the respondents - the responses are considered to be "superficial" indicators only of what the respondents are likely to do. A will use, B will not use, C will use, D will not use and E will use.

i.e. 60% will use.

- Emphasise that trainees should avoid "selling" a proposed new service during a survey undertaken to find out whether or not the new service will be used. It is very easy to obtain a favourable response to a "sales pitch", when no actual buying decision must be made at the time.

Handout 1A

Member A

You are an enthusiastic member of the Agrarian Farmers' Society and you are always keen to have new facilities and services. You eagerly take advantage of any new service provided which you can use. You farm ten hectares, but your children are all working at good jobs elsewhere and so you are short of labour. You borrow a neighbour's buffalo to plough your land, but this is unreliable and slow. You tried a private tractor hire service last year, but the tractor arrived two weeks late and broke down on the job. You think the society should help members more with this and other problems. You feel the society's response is rather slow and you criticise them for this.

(CUT HERE)

Handout 1B

Member B

You are not a successful farmer, but you always feel that things will improve. You do not intend to try harder yourself, but you expect to get more help from the Agrarian Farmers' Society and other outside bodies. In previous seasons, perhaps because your crop has not been ready, or as a result of some other failure on your part, you have not been able to take advantage of improved marketing services, or new varieties of crop. You are a confirmed optimist however, and will always welcome any new initiative, so long as it cost you nothing to be in favour of it. You farm five hectares, more or less, and most of the work is done by your wife and family. (They allow you to believe that you really make all the decisions.)

Handout 1C

Member C

You farm eight hectares. You are usually slow to adopt new ideas or to make use of new facilities but you are very successful because you are methodical and hardworking. You are very unwilling to support new ideas because you like to see things in action before you commit yourself. You play little part in the affairs of the Agrarian Farmers' Society, but once you are convinced of their value you make good use of the society's facilities. You have had some problems completing ploughing in time, but believe that these can be overcome by more careful planning and working longer hours.

(CUT HERE)

Handout 1D

Member D

You are a member of the Agrarian Farmers' Society only because the society has a monopoly of the supply and marketing of certain items. You dislike the society and its management, and you have as little as possible to do with them. You make the minimum use of the society's facilities, preferring wherever possible to deal with independent traders, even if it costs you more money. You farm 12 hectares, and you find it very difficult to complete your ploughing in the short interval between harvest and sowing. You had an unsatisfactory experience with a private tractor hire service last year but you hope to do better this year.

Handout 1F

Member F

You farm seven hectares. Last season you attempted to farm an extra two hectares and the results were disappointing. You are not sure whether this was because of poor seed, inadequate weeding or hasty ploughing, but you hope to improve this year. You welcome assistance and advice from the Agrarian Farmers' Society. You object however to attempts by the society's management to promote their services as if the society was merely another private trader trying to make money. As a convinced co-operator, you feel that a society should support and aid its members, and not try to make money out of them.

Handout 2

The Agrarian Farmers' Society has decided to investigate the possibility of starting a tractor hire service. A number of members have had difficulty ploughing their fields in the brief period between harvest and sowing, and it is felt that such a service would improve yields. The tractor(s) would also be useful for transport and other duties outside the ploughing season. The committee has asked the manager to find out how many of the three hundred members would make use of a tractor hire service if it were offered. A representative sample of fifty members has been selected. You have been asked to construct a questionnaire and administer it to them to find out whether members would use such a service. Interviews must last no longer than five minutes each, and the questionnaire must be simple and brief. The list of the members selected for the sample gives their names and the size of their plots. No other information about them is immediately available to you.

After preparing the questionnaire, you want to check its validity by testing it on a sub-sample of five members. This will also give some idea of the likely views of the larger group. The sub-sample consists of farmers A, B, C, D and E. Their holdings are ten, five, twelve, eight and seven hectares respectively. They have not been warned in any way of the purpose of the interviews you will be conducting with them.

topic

3

forecasting

SESSION 3.1

FORECASTING

Objective: To enable trainees (i) to describe the need for forecasting, (ii) to identify what should be forecast and (iii) to list and explain factors affecting future values.

Time: 1 to 1 1/2 hours.

Session Guide:

1) Any form of planning requires a forecast. Ask trainees to suggest forecasts which they have made today or this week.

   Daily life involves forecasts about weather conditions, other people's reactions, prices, availability of transport and other services and, by implication, the value of "investments" such as attending a course.

2) Projects, or investment proposals, are wholly concerned with the future. Every piece of information therefore requires a forecast. Ask trainees to consider a typical crop processing project, involving capital costs for installation, substantial operation costs and income from a processing crop which is sold in world markets. On what factors do the economics of such a project depend?

   - The initial investment.
   - The cost of operating the facility.
   - The purchase cost of the input to be processed.
   - The selling price of the output.

   Ask trainees which factors are likely to influence each of these in the future.

Initial Investment

- General level of inflation. (U/C)
- Delay between present time and actual investment being made. (C)
- Management of installation work. (C)
- Quality of initial planning design. (C)
- Likelihood of technical change between present and time of installation. (C)
- Reliability of contractors. (C)

Costs of Operation

- The general level of inflation. (U/C)
- The management of the plant. (C)
- The details of initial planning and operation. (C)
- The likelihood of particular supplies changing in cost more or less than the general level of inflation. (U/C)

Purchase Cost of Unprocessed Input

- The general level of inflation. (U/C)
- Weather conditions. (U/C)
- National pricing policies. (U/C)
- Societies pricing policies. (C)
- World price movements. (U/C)
- Volume of members' production. (C)
- Transport facilities available. (C)

Selling Price of Output

- The general level of inflation. (U/C)
- Weather conditions. (U/C)
- The quality of the output. (C)
- National pricing policies. (U/C)
- World price movements. (U/C)

Write the above on the chalkboard/OHP.

3) Ask trainees to suggest which of these are, or are not, beyond the control of the society and its management.

Mark the above list accordingly. The suggestions given in brackets, (C = Controllable, U/C = Out of Control) are merely one possibility.

Ask trainees which data are more difficult to forecast. Data beyond the control of the society will require more forecasting skills than the items which can be influenced by the society. Ask trainees to suggest common forecasting errors which may have been responsible for project failures. The list should contain the following:

- Much forecasting concentrates on market demand and prices for produce and neglects other factors which are more within the control of the society (e.g. keeping transport costs down).
- Many projects fail because input costs, and in particular construction and operation costs, are underestimated.
- The income or benefit may be reasonably accurately forecast, but the investment or costs are frequently underestimated.

Data which are controllable and easy to forecast are usually where the most serious forecasting errors occur.

4) Stress that the success of co-operative projects often depends, not on the quality of forecasting the uncontrollable factors, but on the quality of management of the controllable factors.

5) Ask trainees to identify one common uncontrollable factor in all factors.

The "general level of inflation" may be the major factor which makes costs and prices in the future different from what they are today. Ask trainees how inflation can be taken into account when assessing a project.

Trainees may suggest increasing figures arising during future years by some factor in order to take account of inflation. Use

the following simple example to show that, since the objective is to compare costs and benefits each year, inflation which affects all items equally, can be ignored.

Example

Ask trainees to consider a project where costs and benefits this year are as follows:

Costs	$ 9,000
Benefits	$ 10,000
Profit	$ 1,000 or 10% profit margin.

Assume prices and costs double next year because of inflation. What will be the profit margin?

Costs	$ 18,000
Benefits	$ 20,000
Profit	$ 2,000 or 10% profit margin.

In other words, the profit margin is not changed by inflation, provided the inflation affects costs and benefits equally.

Ask trainees to suggest items whose prices in the past moved differently from the general level of inflation.

- Petroleum and derived products.
- Agricultural commodities.
- Wage rates or other items subject to government control.
- Imported or exported items whose prices are affected by international exchange rates.

6) Ask trainees how successful professional economists, commodity brokers and others have been at forecasting price movements of petroleum products and agricultural commodities. In view of this, a co-operative society manager cannot expect to be any more successful.

Point out that not every commodity price is as volatile as coffee or sugar. Nobody can fault a project proposal which is based on reasonable forecasts, using all the relevant, available data.

SESSION 3.2

FORECASTING METHODS

Objective: To enable trainees to apply simple forecasting techniques based on past data, and to identify possible errors that arise as a result of relying exclusively on limited quantitative data.

Time: 2 to 3 hours.

Material: Exercise and graph paper.

Session Guide:

1) Ask trainees to rate the likely accuracy of each of the following forecasts:

   - "This sun will rise tomorrow".
   - "This coin will turn up heads on the next toss".
   - "The sun will not come up tomorrow".

   Clearly they are "true", "50% likely" and "untrue". Ask trainees on what data they base their rating.

   All forecasts about the future are based on observations about what has happened in the past. Without some past experience, it is impossible to forecast the future.

2) Distribute the exercise sheet and ask trainees to complete the forecasts required. They should use graph paper in order to plot the past data and to indicate the future values. Allow up to 45 minutes for completion of the exercise, and circulate among trainees to ensure that they are not missing the point.

3) Reconvene the group and ask them to give their answers and to explain their reasoning.

   It is probably inappropriate to introduce mathematical details such as moving averages, smoothing techniques and so on.

It is unlikely that trainees will need to use such techniques sufficiently often to justify the time spent in learning them. Moreover, the approach suggested in the following answers introduces the basic ideas without using any specialised terminology or complicated techniques. If trainees can plot historical data on graph paper, the forecast suggested below will be more easily understood.

A possible, but not necessarily the only right set of answers is as follows. Graphs for these answers are prepared for handing out to trainees and/or reproduced on OHP see "Forecasting Exercise: Possible Set of Forecasts".

a) 1980 = 16,100 tons. 1981 = 17,700 tons. 1981 = 19,500 tons. 1983 = 21,400 tons. 1984 = 23,600 tons.

This continues the annual increases of 10%, rounded to the nearest hundred tons. The past figures rose by exactly 10% per year. This is too regular for a natural market demand, and implies inaccurate figures or consumption limited by government regulations. In either case more information is required.

b) 1980 = $68. 1981 = $70. 1982 = $71. 1983 = $71.

The three most recent years showed a rapid but diminishing increase. This has been continued for the four future years. The period of stability from 1976 to 1977 may be repeated. Prices may be subject to government controls. Investigations must be made to determine whether the prices are so controlled, and what future policy is likely to be.

c) 1980 = $2,400. 1981 = $4,800. 1982 = $2,400. 1983 = $2,400. 1984 = $4,800.

The previous ten years showed a regular pattern as follows:

- X, X, 2X, 4X.
- 2X, 2X, 4X, 8X.
- 4X, 4X,

This has been extended for the five following years, on the assumption that consumption is drastically reduced after the large price increases, so that prices drop for two years.

Pressure of demand then reasserts itself to repeat the pattern of drastic price increases, followed by partial return to lower levels. An international commodity agreement may be attempting to control production and prices of a commodity whose price behaviour is so volatile, or other external forces may be involved. Further inquiries must be made.

d) 1980 = $28. 1981 = $30. 1982 = $30. 1983 = $30. 1984 = $35. 1985 = $36. 1986 = $36. 1987 = $38.

This shows a very random movement, but steadily upwards. Drastic increases appear to be followed by periods of steady but slow increase. The cycle has been continued in the future forecast, with little confidence of accuracy. Technical or political factors may be involved and should be investigated.

e) 1980 = first quarter $55, second quarter $50, third quarter $45, fourth quarter $40.

1981 = first quarter $45, second quarter $50, third quarter $55, fourth quarter $60.

This product appears to have a one year price cycle, and the "U" shaped cycle has been continued for the next two years starting from the high base reached at the end of 1979. The cycle may not be repeated however. It may be moving up or down over a longer time trend and the dip may just be a small drop on an otherwise steady long-term movement upwards, downwards or at the same level. Figures over a longer period would have to be examined if at all possible.

f) 1980 = 6,500 tons. 1981 = 6,200 tons. 1982 = 5,900 tons. 1983 = 5,700 tons. 1984 = 5,500 tons.

A five year decline, at a slightly decreasing rate, has been continued in the forecast. This may however be one side of a ten year "U" cycle for a tree crop with a long replanting cycle, for example, or production may be expected to steady once the total reaches the level required for home consumption, since the decline may be caused by reduced demand for marketed surplus. Closer investigation is needed.

4) To show that the knowledge of a commodity and local conditions will to a great extent influence the "pure mathematical" forecasting, introduce the following exercise. You should have collected and plotted on graph paper:

- past price data for two to three common agricultural products well known to the trainees;
- the evolution of monthly wages for unskilled labour in the country;
- the monthly sales figures of a certain crop by a large crop marketer for the last two years.

Distribute copies of the graphs to the various groups and ask trainees to plot the future evolution of above prices and wages on the graph paper.

Allow up to 30 minutes for this. Let groups report on their forecasts. The purpose of the exercise is not to discuss the differences in "forecasts" between the various groups - only the future will show who has made the best forecast. The emphasis of the discussion should be on the fact that estimates based on figures alone are of little value.

5) Ask trainees to suggest factors which might be known to a manager preparing a project, and which might be expected to alter radically forecasts based merely on past historical data.

- The establishment of an international commodity agreement.
- The attack of a crop disease in a country which is a large producer of an internationally traded commodity.
- Political groupings which could lead to effective manipulation of price or supply for political purposes.
- Development of substitutes which may reduce the value of an existing product, or render it entirely obsolete.
- Price or supply problems affecting a substitute which will lead to a recovery in demand for the original product.

- Forthcoming government legislation to control the price of production of a particular commodity.
- The development of new plant varieties or other technical changes likely to lead to greatly increased production.
- The introduction of improved marketing facilities which would encourage more farmers to grow the crop in question.

Emphasise that managers must keep in touch with local, national and international events. This way they will be aware of factors which may have a far greater impact on prices, or production behaviour, than could be interpreted from past data alone.

Forecasting Exercise

a) National consumption of commodity A has been as follows from 1975 until 1979:

1975 = 10,000 tons. 1976 = 11,000 tons. 1977 = 12,100 tons.
1978 = 13,310 tons. 1979 = 14,640 tons.

What are the most likely figures for the next five years, i.e. from 1980 until 1984?

b) The price of a certain item B in your region has been as follows for the four years from 1976 until 1979:

1976 = $50. 1977 = $50. 1978 = $60. 1979 = $65.

What is it likely to be for the period from 1980 until 1983?

c) The world market price of a certain commodity C has behaved as follows over the period from 1970 until 1979:

1970 = $ 300. 1971 = $ 300. 1972 = $ 600. 1973 = $1,200.
1974 = $ 600. 1975 = $ 600. 1976 = $1,200. 1977 = $2,400.
1978 = $1,200. 1979 = $1,200.

How is it likely to behave from 1980 until 1984?

d) The price of a certain input D has moved as follows between 1971 and 1979:

1970 = $ 3. 1971 = $ 3. 1972 = $ 4. 1973 = $ 4. 1974 = $16.
1975 = $17. 1976 = $18. 1977 = $18. 1978 = $18. 1979 = $27.

What is the level of prices likely to be from 1980 until 1987?

e) The price of commodity E has moved as follows during 1978/79:

1978 = First quarter $50, second quarter $45, third quarter $40, fourth quarter $35.
1979 = First quarter $40, second quarter $45, third quarter $50, fourth quarter $55.

What will the likely price level be during each quarter of 1980 and 1981?

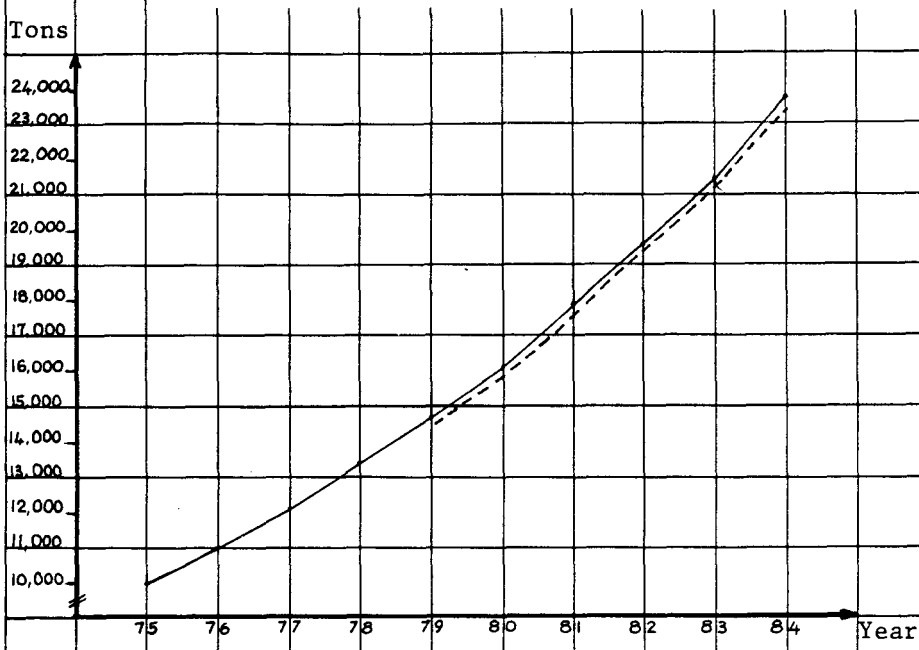
f) Production of a certain commodity F has varied as follows in the years from 1975 to 1979:

1975 = 10,000 tons. 1976 = 9,000 tons. 1977 = 8,000 tons.
1978 = 7,500 tons. 1979 = 7,000 tons.

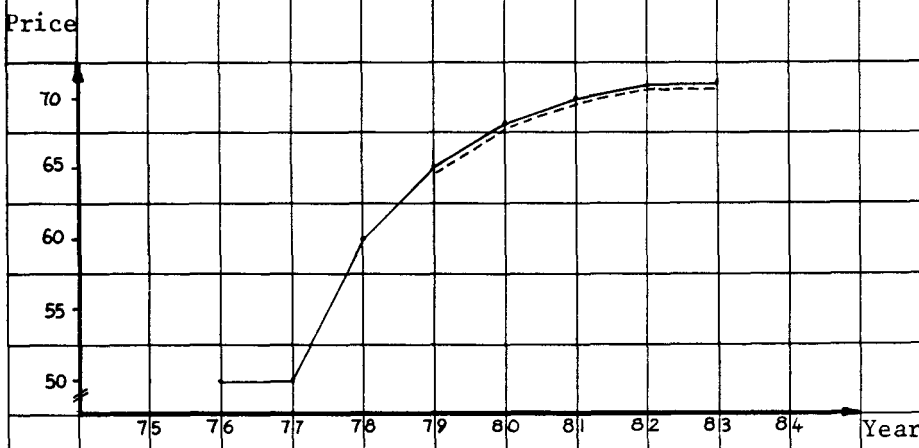
What is production likely to be from 1980 until 1984?

FORECASTING EXERCISE - POSSIBLE SET OF FORECASTS

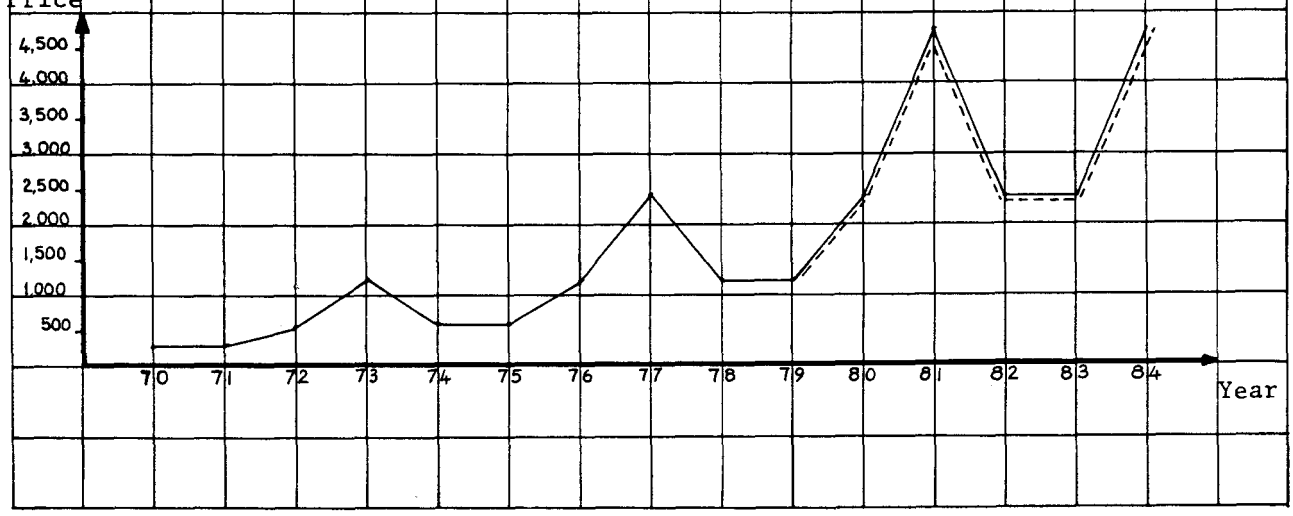
a)



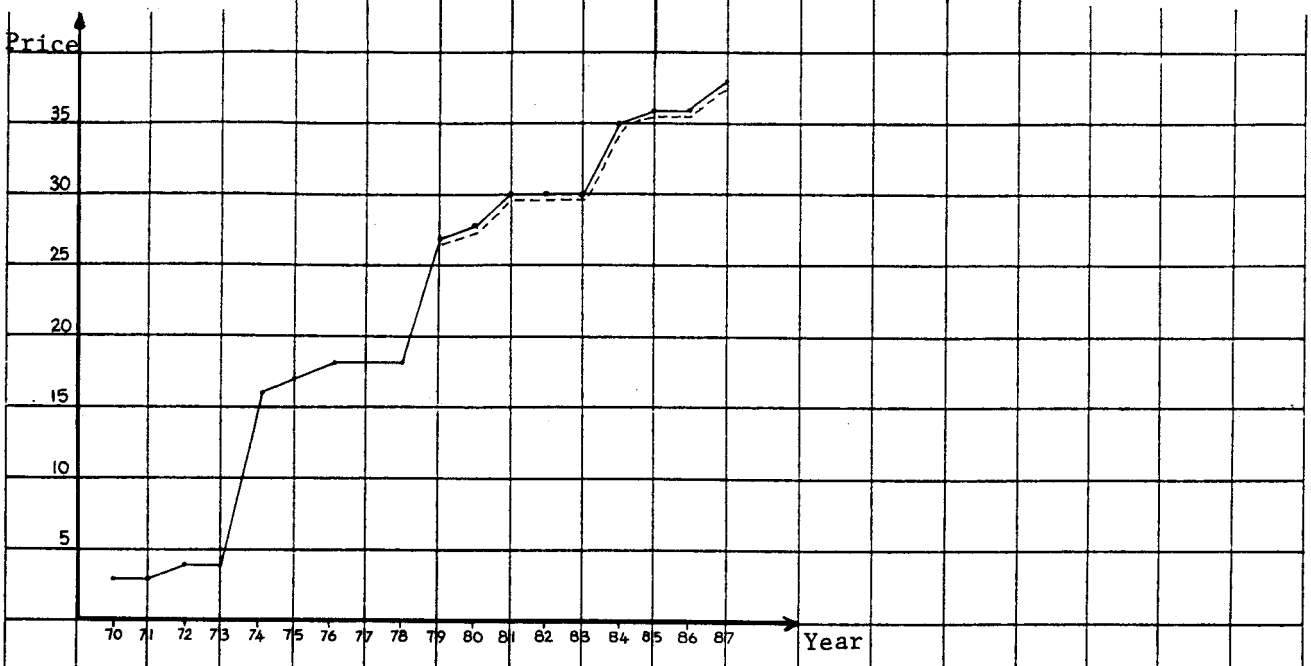
b)



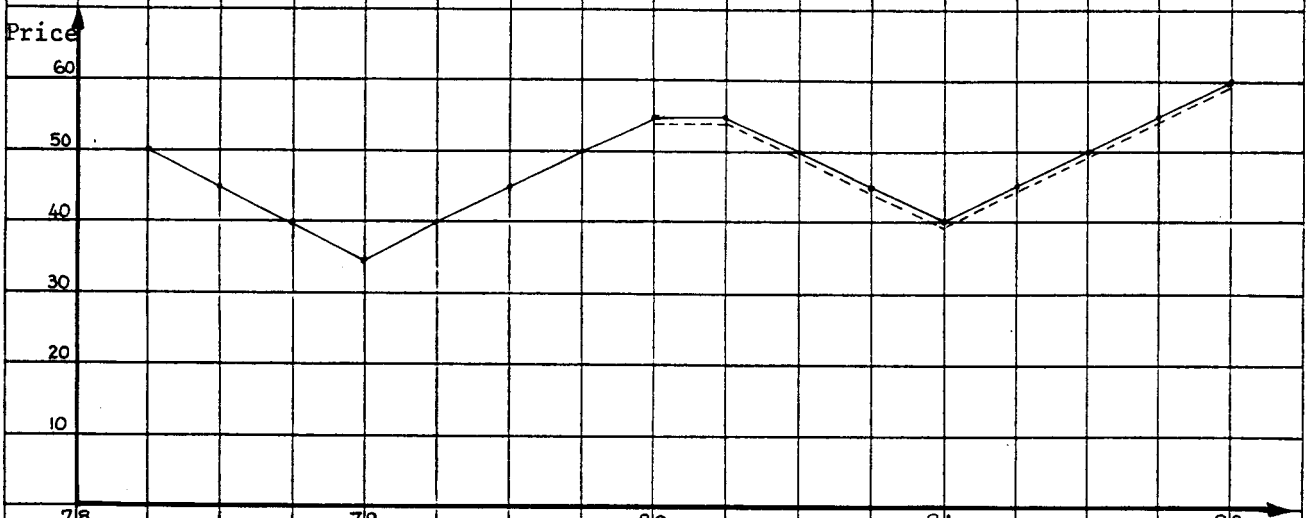
c)



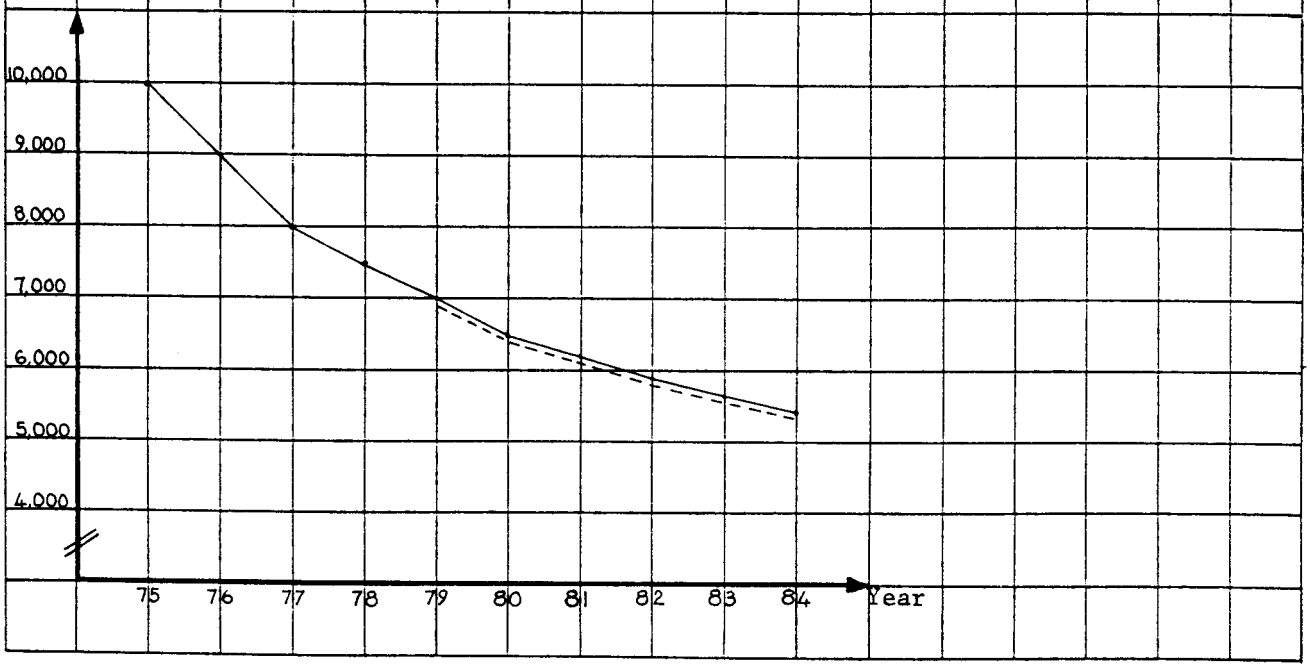
d)


Price
35
30
25
20
15
10
5
70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87
Year

e)


Price
60
50
40
30
20
10
78
79
80
81
82

f)


Production in Tons
10,000
9,000
8,000
7,000
6,000
5,000
4,000
75 76 77 78 79 80 81 82 83 84
Year

SESSION 3.3

FORECASTING IN PRACTICE

Objective: To enable trainees (i) to identify those data which must be forecast, (ii) to determine the information necessary for making forecasts and (iii) to make forecasts, based on whatever information is available.

Time: 3 to 32 hours.

Material: Case Study "The Egg Project".

Session Guide:

1) Divide trainees into groups. Distribute the case study and allow them up to two hours to produce their conclusions. If possible, the case study should be handed out for individual reading well before the session. If possible, trainees should be provided with graph paper. It should be made clear that the objective of the exercise is not so much to make calculations, as to identify items of information which are, or are not, relevant.

2) Reconvene the group and ask one group to present their answer to the first question. Be sure that they avoid excessive detail. Ask other groups to mention only those items which have been omitted by the reporting group.

The information should relate to the following general topics:

- The number of members with farms with the resources to start modern egg production.
- The number of members actually intending to enter the scheme.
- The experience of other societies which may have started similar schemes.
- Egg production and feed consumption of birds of the type proposed.
- Eggs of each grade produced by birds of the type proposed.

- Cost of construction and operation of the proposed grading, storage and transport facilities.
- Specific data on the start-up date and supply position of the layers' mash milling factory now under construction.
- The price the milling factory is likely to charge for its layers' mash.
- The number of co-operatives or other organisations which have started or may start similar schemes, together with their egg production potential.
- The identification of appropriate channels of distribution for AFS eggs, together with initial reactions of their buying staff to the possibility of buying AFS eggs.
- The gross profit margins which open stores and supermarkets normally expect on eggs.
- The future potential of the market.

3) Stress that:

- the information obtained by the manager covers only the marketing and feed side of the project;
- general statistical data are no substitute for specific information on buyer reactions (will the traders actually buy our eggs?), price mark-ups (what mark-up will the traders actually apply?), or members' intentions (how many members will actually start to raise chickens and with what success?).

4) Ask another group to go through their answers to the second question. Opinions will differ, but a possible outline is as follows:

a) The population is rising. This fact is relevant both to the need for employment on AFS member farms, and to the growing market for eggs. The fact alone, however, without further analysis, is sufficient and there is nothing to be gained by calculating whether the population will increase by one per-cent more or less.

b) The proportion of people living in urban areas is growing very rapidly. This factor is encouraging for the egg project, but

the exact percentage now or in the future need not concern the AFS.

c) The figures for egg imports have steadily declined. The steep decline in the second half of each year, followed by a recovery, appears to have ended in 1978. However, it is probably reasonable to expect a further steep decline in the second half of 1979, followed by continuing decline with some seasonal variations. The exact figures are less important than the reasons behind them. Import figures should be compared with the estimates of total egg consumption as follows:

- 1979 total national egg consumption 20.9 x 11.1 million = 232 million per year. Imported eggs = 37 million per year, i.e. 16%.
- 1975 total national egg consumption 20.4 x 10.6 million = 216 million per year. Imported eggs = 72 million per year, i.e. 33.3%.

Inflation since 1975 has amounted to 40%. The cost of imported eggs has nearly doubled over the same period, while prices of eggs in supermarkets have increased by an average of 27% only. This indicates that more quality eggs are being produced locally. The figures for imports of layers' mash suggest the same conclusions. ' AFS management must carefully investigate the actual and potential competition to ensure that the market will not be glutted.

d) The layers' mash import statistics are of interest since they confirm the conclusions mentioned earlier. In addition, they confirm the likely demand for mash from the mill now under construction. AFS management must therefore ensure that they will be able to obtain supplies from the new mill, particularly if the total capacity of the mill is going to be less than forecasted imports; these might be as follows if the mill were not to be built:

- 1979 second half = 11,000 tons.
- 1980 first half = 13,500 tons.
- 1980 second half = 15,500 tons.

- 1981 first half = 18,000 tons.
- 1981 second half = 20,500 tons.

To this projection must be added whatever demand is likely to arise as a result of (i) local production and availability of layers' mash, and (ii) presumably lower prices. If the above forecasts are over or near the planned capacity of the new mill, and there are no plans for expansion of milling capacity, some egg producers will have to rely on imported layers' mash at far higher costs. Therefore, at this stage, it will be vital for the management to secure a guarantee of supplies from the local mill.

e) The figures for local poultry population are irrelevant. They include what must be a very approximate estimate for the traditional village poultry, and do not show the quality stock separately.

f) National egg consumption per capita is rising along with growing urbanisation. This suggests that there should be a secure growing market for "modern sector" egg production, such as that proposed by the AFS.

g) The supermarket retail prices moved steadily upwards until the end of 1978 but did not completely keep pace with inflation. During the first two quarters of 1979 prices declined. This may suggest (i) an increasing proportion of locally produced eggs and/or (ii) falling local prices. This must be investigated. The fall from $1.95 to $1.85 in six months may appear small, but this amounts to about 10% drop in prices per year or, if continued, a halving of prices in six years. Clearly this would be disastrous for the AFS project, and the reasons must be investigated.

h) The stall holder prices are about 30% below supermarket prices. Stall holders may get their eggs much cheaper from the producers than supermarkets do, or the mark-ups applied by the stall holders may be far lower than those in supermarkets. The conclusion is, therefore, that selling prices are similar, or at least not as different as the final retail prices would suggest.

The recent fall in egg prices in supermarkets is worrying, but not when considering the following:

- imports of eggs have more or less been halved over the last four years;
- the proportion of eggs sold in supermarkets and obtained from local sources is increasing.

Since imported eggs are more expensive than locally produced eggs, the fall in egg prices in supermarkets is probably caused by a reduction in the proportion of imported eggs, rather than lower local prices.

i) Transport costs will be an important element in the economics of the new operation. The latest rate of increase, namely 14% per year, is about double the current rate of inflation, and this should be allowed for in the calculation of the costs of operation.

j) The rate of inflation is vital in order to measure whether prices have increased faster or slower than inflation. Inflation itself can be ignored in project proposals (see Session 3.1). However, significant costs, which are likely to move at a significantly different rate from inflation, must be altered accordingly.

5) Suggest the general lessons arising from the exercise:

- General statistical information is usually quite easy to obtain and is of little direct relevance to specific project proposals.
- Statistics should not be studied in isolation. More use can be made of them if they are combined and compared with one another.
- Retail selling prices can be misleading. High retail selling prices do not necessarily mean high prices paid to the producer. Low price retailers may operate on a smaller trading margin than high price retailers. In this case the low price retailer may actually pay the producer more than the high price retailer does.

- Published information has to be obtained from a large number of different sources. This can save field work aimed at finding out what is already available, but often the data are presented for periods, or in units which makes it difficult to relate to other data. The necessary changes must be made before the figures can be of any value.

The Egg Project

The manager of the Agrarian Farmers' Society was anxious to put forward a good case for the proposed egg grading and packing facilities. Thanks in part to the manager's prompting, the committee had suggested the idea and the 1979 Annual General Meeting had voted unanimously that the plan should be implemented as soon as possible. A total of about one hundred thousand dollars was needed to provide transport, grading, packing and storage facilities for the project. The manager had to prepare a detailed submission to the co-operative bank in order to obtain a loan. The first step was to collect all the necessary information so that a convincing case could be put forward.

The society has some one thousand members, five hundred of whom are actively involved in the society's affairs. The staple crop is maize. The society markets members' surplus to the National Maize Marketing Board. The society provides a range of farm inputs to members, including fertilizer and seed. A tractor hire service is operated for the benefit of members.

The population of the region is growing, and land is scarce. There are few employment opportunities elsewhere for the families of members. Although the new crop varieties require more intensive cultivation and weeding than the traditional ones, there are still a lot of people who are seriously underemployed most of the year. Most families raise a few chickens for meat and eggs. The proposal is to modernise this activity by encouraging members to invest in units of one hundred pullets, housed in properly designed, prefabricated huts.

The co-operative bank is prepared to provide medium term credit to members for purchase of the initial stock and housing, so long as the society can present a convincing case for the processing and marketing of the eggs. The manager is not sure how many members will take up modern poultry raising if the project is approved, or when, but there is no doubt that this activity could provide valuable extra income and employment for farm families.

It is proposed that the Agrarian Farmers' Society will sell feed to members and this would if necessary be provided on credit and set against the individual member's receipts from sale of eggs.

Chicken feed is currently imported at rather high prices, but a local mill is opening shortly. This will provide layers' mash at competitive prices. Members might be able to supplement the diet with carefully chosen produce from their own farms. The society will also sell day-old chicks, or point-of-lay pullets, to members as their stock passes peak laying ability. The cost of this could also be set against egg sales. It is expected that sales of chickens for meat will take place through the traditional channels, and the society does not intend to become involved in this trade.

The manager proposes to operate an egg collection service to collect eggs from members at least once a week. The exact number of vehicles will depend on how many farmers decide to start raising poultry, but the manager estimates that one vehicle should be able to collect from one hundred and fifty members per week. The eggs will be taken to the proposed grading facility, where they will be inspected, graded, packed and stored in a cold room prior to despatch. Members will be required to clean eggs before collection. A penalty system could be introduced to deal with excessive proportions of cracked or addled eggs.

There is a growing demand in urban areas for graded eggs from supermarkets and other modern retail outlets. Large numbers of eggs are still imported by air from abroad, and a number of local suppliers (co-operative and private firms) are attempting to enter the market. They aim to compete with, and eventually displace, the imported supplies. It is becoming increasingly difficult to keep one or two chickens in the city itself, and as people's ties with rural relatives loosen, it becomes less convenient to fetch supplies privately from rural areas.

The expatriate community and senior government and industrial staff are willing to pay a premium for eggs which are clean, uniform and well packed. The supermarkets catering for these elite are anxious to obtain reliable supplies of graded eggs. The lower income people in the urban areas are less concerned with appearance. However, since the urban population is growing very quickly, there is an increasing demand from stalls catering for the urban masses. This market does not obtain such a high price, but smaller and less uniform eggs, or any temporary surplus over the supermarkets' requirements, can always be disposed of through these channels.

The manager knows that the success of a project of this sort depends on a lot of different factors. He has collected a large amount of data which appears to relate to various aspects of the project. He looks at the mass of figures and wonders of what value the various kinds of information will prove to be. He asks himself where he ought to begin!

a) National Population

1970 (census) 10 million
1971 10.2 million (estimate)
1972 10.4 million (estimate)
1973 10.6 million (estimate)
1974 10.8 million (estimate)
1975 (census) 10.6 million
1976 10.8 million (estimate)
1977 10.9 million (estimate)
1978 11.1 million (estimate)

Source: National Statistical Office.

b) Urban Population as a Percentage of the Total

1970 11% (census)
1971 12.1% (estimate)
1972 13.3% (estimate)
1973 14.6% (estimate)
1974 16.1% (estimate)
1975 20% (census)
1976 23% (estimate)
1977 25% (estimate)
1978 28% (estimate)

Source: National Statistical Office.

c) Egg Imports per Month with Average Price per Dozen c.i.f. Our Airport

Year	Time	Quantity	Price
1975	First Half	Average 600,000 Dozen	65 cents
	Second Half	Average 400,000 Dozen	66 cents
1976	First Half	Average 550,000 Dozen	72 cents
	Second Half	Average 350,000 Dozen	76 cents
1977	First Half	Average 530,000 Dozen	85 cents
	Second Half	Average 300,000 Dozen	92 cents
1978	First Half	Average 250,000 Dozen	$1.01
	Second Half	Average 240,000 Dozen	$1.15
1979	First Half	Average 270,000 Dozen	$1.20

Source: Customs and Excise.

d) Layers Mash Imports per Month

1977	First Half 3,000 tons	Second Half 4,500 tons
1978	First Half 3,500 tons	Second Half 7,000 tons
1979	first Half 9,000 tons	

Source: Customs and Excise.

e) Poultry Population

1975	1.75 million	1978	2.10 million
1976	1.90 million	1979	2.25 million
1977	2.05 million		

Source: Approximate estimate by Ministry of Agriculture's Small Farm Survey.

f) Egg Consumption per Capita per Year

1975	20.4	1978	20.7
1976	20.3	1979	20.9
1977	20.5		

Source: Food Consumption Survey, Ministry of Health.

g) Average Retail Price per Dozen of Eggs in Urban Supermarkets

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1976	$1.40	$1.55	$1.58	$1.60
1977	$1.70	$1.75	$1.80	$1.90
1978	$2.00	$2.00	$1.90	$1.95
1979	$1.90	$1.85		

Source: Information provided by Supermarket management.

h) Average Retail Price of Eggs in Urban Market Stalls

1977 First Half 8 cents each Second Half 8 cents each
1978 First Half 9 cents each Second Half 10 cents each
1979 First Half 11 cents each

Source: Urban Market Survey carried out by University Department of Agriculture.

i) Average Cost of Transport per Ton from AFS Region to Capital City

1976 $12.50	1978 $15.80
1977 $13.75	1979 $18.00

Source: Records of AFS.

j) Average Rate of Inflation

1973 8%	1977 9%
1974 15%	1978 9%
1975 12%	1979 8%
1976 10%	

Source: Central Bank.

Assignment

Advise the manager of AFS as follows:

1) Outline the information he will need in order to put together an effective proposal for the egg project.

2) State the implications (if any) of each of the tables of information for the viability of the project.

topic

4

timing, valuation and appraisal

SESSION 4.1

COSTS AND BENEFITS OF A PROJECT

Objective: To enable trainees (i) to distinguish between a "feasibility study" and a "profit and loss account" for a specific project or activity, and (ii) to identify the costs and benefits of a project, through the correct completion of a statement of cash inflows and outflows for that project.

Time: 1 to 2 hours.

Session Guide:

1) Ensure by inquiry that all trainees, and not merely the most articulate, are familiar with normal accounting practice and the meaning of a profit and loss account. Ask trainees to suggest the items which might be included in a yearly profit and loss account for a single vehicle transport operation. Write the results on the chalkboard/OHP along the following lines:

- Revenue $12,000
- Costs:

Depreciation	$ 2,500	(Purchase price vehicle $20,000, to be written off over eight years)
Maintenance	600	
Fuel	2,400	
Garaging	600	
Driver's Wages	1,800	
Administrative Overheads	1,200	
Total Costs	$ 9,100	

- Total Surplus $2,900

2) Ask trainees to suggest whether these figures indicate a viable operation. The surplus appears adequate, and may even indicate overcharging. Ask trainees what factors might prevent such an op eration from starting, or might bring it to bankruptcy after a few months operation.

Use the following extreme example to emphasise the importance of the timing of the cash inflows and outflows:

- assume the vehicle in the example has been bought with an interest-free loan of $20,000, repayable in eight yearly instalments of $2,500, payable of the 30th June each year;
- all other costs are also to be paid in the first six months of each year;
- the revenue will only be received in December of each year.

The profit and loss account will not change and the operation will apparently remain equally profitable. The transport operation will however not survive very long, since it will not have the necessary cash when the costs fall due for payment.

3) Take another example. Ask trainees how the "profitability" and the "profit and loss account" for the above transport operation will change under the following circumstances:

- Vehicle cost $20,000 payable in cash on delivery.
- Operating costs payable in cash on receipt of services.
- Revenue payable on the tenth of the month following a service.

As in the first example, these factors will in no way affect the profitability and the profit and loss account for the operation.

Summarise and conclude as follows:

- whether a project is viable or not will not only depend on whether the project is profitable but also on the availability of cash when it is needed;
- to know whether cash will be available when it is needed, the timing, as well as the amounts of cash money coming in (cash inflows) and going out (cash outflows), must be known;

- the "profit and loss account" does not give any information about timing and amounts of cash inflows and outflows;
- it is therefore necessary to have another method of analysis which will show the timing and amounts of cash flows.

4) Refer trainees back to the profit and loss account for the single vehicle transport operation and the conditions given in 3) above. Allow them 10 to 15 minutes to list the monthly cash inflows and outflows for the first year of the project, assuming revenue and costs to be divided equally over the 12-months' period.

5) Many trainees will include depreciation at $2,500 per year as a cash outflow. It is vital that all should understand that this reflects an accounting convention and not a regular cash outflow (the error must be corrected by question rather than by statement). Ask trainees who have made the mistake, to state the recipient of each cash outflow which they have identified. They should clarify the point that vehicles purchased for cash only have to be paid for once, i.e. at the beginning.

6) Ensure that all trainees complete the statement of cash inflows and outflows correctly as shown below. Explain each figure and stress the need for accurate simplp calculations. (The following table includes net, and cumulative net figures to be filled in later as suggested.)

Time	Cash Out	Cash In	Net for Month	Cumulative Net
Start	$ 20,000	Nil	($ 20,000)	($ 20,000)
Month 1	$ 550	Nil	($ 550)	($ 20,550)
Month 2	$ 550	$ 1,000	$ 450	($ 20,100)
Month 3	$ 550	$ 1,000	$ 450	($ 19,650)
Month 4	$ 550	$ 1,000	$ 450	($ 19,200)
Month 5	$ 550	$ 1,000	$ 450	($ 18,750)
Month 6	$ 550	$ 1,000	$ 450	($ 18,300)
Month 7	$ 550	$ 1,000	$ 450	($ 17,850)
Month 8	$ 550	$ 1,000	$ 450	($ 17,400)
Month 9	$ 550	$ 1,000	$ 450	($ 16,950)
Month 10	$ 550	$ 1,000	$ 450	($ 16,500)
Month 11	$ 550	$ 1,000	$ 450	($ 16,050)
Month 12	$ 550	$ 1,000	$ 450	($ 15,600)

7) Ask trainees to fill in the fourth column giving the net cash flow (positive or negative) for each month. Figures will be as shown in the list above. Negative net cash flows are written in brackets.

Ask them to fill in the fifth column, giving the cumulative position. Ask them how many months it will be necessary to operate the vehicle for before the cumulative figure reaches zero. ($15,600 divided by $450 equals 34 months; added to the first 12 months it amounts to a total of nearly four years.)

Ask trainees what would be the effect of a moderate redistribution of surplus - say $200 a month - after the end of the first year. (The total period after the first year would be extended to 62 months, or more than five years).

8) Ask trainees to consider the implication of the negative cash flows during the first two months of the transport operation and

the cumulative negative hire figures. The operation will not be able to start unless the vehicle is financed by a loan or bought on hire purchase, which amounts to the same thing.

What would be the extra monthly repayment if (i) the vehicle was purchased on five year hire purchase terms, or (ii) the principle and total interest is $10,000 spread evenly per month? ($30,000 divided by 60 equals $500 per month repayment.)

What effect on the monthly surplus would such a monthly repayment have? (A deficit of $50 per month, before any distribution of surplus.)

9) Ask trainees to recalculate the cash flows, assuming that the only customer is a government department which actually pays all its bills half yearly, i.e. at the end of the six months' period during which the services have been received. The table will appear as follows:

Time	Cash Out	Cash In	Net for Month	Cumulative Net
Start	$ 20,000	Nil	($ 20,000)	($ 20,000)
Month 1	$ 550	Nil	($ 550)	($ 20,550)
Month 2	$ 550	Nil	($ 550)	($ 21,100)
Month 3	$ 550	Nil	($ 550)	($ 21,650)
Month 4	$ 550	Nil	($ 550)	($ 22,200)
Month 5	$ 550	Nil	($ 550)	($ 22,750)
Month 6	$ 550	Nil	($ 550)	($ 23,300)
Month 7	$ 550	$ 6,000	$ 5,450	($ 17,850)
Month 8	$ 550	Nil	($ 550)	($ 18,400)
Month 9	$ 550	Nil	($ 550)	($ 18,950)
Month 10	$ 550	Nil	($ 550)	($ 19,500)
Month 11	$ 550	Nil	($ 550)	($ 20,050)
Month 12	$ 550	Nil	($ 550)	($ 20,600)

Remind trainees that this change would in no way change the profitability of the project. Show however that it increases the financing requirement from a maximum of $20,550 in the previous case, to $23,300 in this case, with consequently higher interest charges.

10) Ask trainees to recalculate the schedule once again on the following assumptions:

- Vehicle bought for cash at start.
- Customers' bills payable six months in arrears.
- Fuel to be bought and paid for six months in advance of use.
- Garage rental payable annually in advance.

Time	Cash Out	Cash In	Net for Month	Cumulative Net
Start	$ 21,800	Nil	($ 21,800)	($ 21,800)
Month 1	$ 300	Nil	($ 300)	($ 22,100)
Month 2	$ 300	Nil	($ 300)	($ 22,400)
Month 3	$ 300	Nil	($ 300)	($ 22,700)
Month 4	$ 300	Nil	($ 300)	($ 23,000)
Month 5	$ 300	Nil	($ 300)	($ 23,300)
Month 6	$ 1,500	Nil	($ 1,500)	($ 24,800)
Month 7	$ 300	$ 6,000	$ 5,700	($ 19,100)
Month 8	$ 300	Nil	($ 300)	($ 19,400)
Month 9	$ 300	Nil	($ 300)	($ 19,700)
Month 10	$ 300	Nil	($ 300)	($ 20,000)
Month 11	$ 300	Nil	($ 300)	($ 20,300)
Month 12	$ 2,100	Nil	($ 2,100)	($ 22,400)

This increases the maximum financing requirement to $24,800, and further lengthens the period during which finance is required.

11) Ask trainees to suggest what may be the effect of inflation on problems of this sort, particularly as the project continues over several years.

Trainees will probably concentrate on the higher cost aspects. Remind them that revenue will almost certainly also be increased in proportion, although perhaps with some delay. With effective management the surplus is therefore likely to increase in line with inflation.

Ask trainees to suggest any cash inflow or outflow which will definitely not increase with inflation. Elicit the following from the trainees: repayments of the principle, and total interest charges, if not indexed, will remain static. Ask trainees to consider the implication of this for the burden of repayment. Clearly, it will become progressively less onerous.

Trainees may not appreciate the benefits to a borrower (and the cost to a lender) of inflation. Ask them which of the following situations they would prefer:

a) To borrow $1,000, to be repaid over five years with interest included, at an annual rate of $220. The money is to be invested in a project which will (i) produce 2,000 units a year of product x, (ii) consume 500 units a year of raw material y and 800 hours of labour. As there is no inflation, prices and costs are expected to remain the same for the complete five-year life of the project, as follows:

- selling price of x = $1 per unit
- cost price of y = $2 per unit
- labour = $1 per hour

b) Exactly as above, but with 10% inflation each year. Prices and costs of x, y and labour will be as follows:

	x	y	labour/hour
Year 1	1.00	2.00	1.00
Year 2	1.10	2.20	1.10
Year 3	1.21	2.42	1.21
Year 4	1.33	2.66	1.33
Year 5	1.46	2.92	1.46

The results of situation a) will be as follows every year:

-	sales		$2,000	
-	raw material : $1,000			
-	labour : $ 800	-	$1,800	
-	surplus		$ 200	
-	loan repayment	-	$ 220	
-	net cash deficit	-	$ 20	(per year or $100 over the five-year period)

The results of situation b) will be the same as above for the first year.

It should not be necessary to work out figures for each subsequent year in order to make the point that the surplus will be bigger each year, while the loan repayment remains the same, and consequently that the borrower will benefit from inflation.

The results of year five alone should make the point:

-	sales		$2,920	
-	raw material : $1,460			
-	labour : $1,168	-	$2,628	
-	surplus		$ 292	
-	loan repayment	-	$ 220	
-	net annual surplus	+	$ 72	

The surplus after loan repayment is in fact as follows in situation b):

- Year 1 : $ -20
- Year 2 : $+0
- Year 3 : $ +22
- Year 4 : $ +46
- Year 5 : $ +72

$ +120

This is clearly preferable to a deficit of $100.

Ask trainees what the average inflation rate in their country is; it is unlikely to be under 10%, so that the benefits to borrowers will be even greater.

12) Inflation can of course have disadvantages as well:

- if it is not necessary to borrow money because of existing resources;
- if costs rise during the implementation of investment so that the actual investment costs become considerably higher than originally planned.

Point out that inflation cannot be predicted, so that it is difficult to allow for its effects.

If inflation is expected to continue at a high rate however, figures should be altered accordingly.

13) Refer to the original trading account for the one vehicle transport operation. Ask trainees whether the administrative overhead would actually be a cash outflow if (i) the operation was part of a larger unit and (ii) the administrative charge was a percentage allocation rather than an actual expense involved in hiring new people.

SESSION 4.2

WHICH COSTS?

Objective: To enable trainees to identify those financial costs which may appear in a profit and loss account, but which should not be considered when preparing and appraising a project.

Time: 1 to 1 1/2 hours.

Material: Case Study "The Transport Dilemma".

Session Guide:

1) Remind trainees of the previous session and of the essential difference between a profit and loss account and a cash flow budget when it comes to assessing the feasibility of a project. Stress that the objective of a feasibility study is:

   - to find out whether or not a project can be done, i.e. whether the project can pay for itself or for what period external finance will be required;
   - to find out whether a project should be done. Project funds can be used in many different ways and a project feasibility study should therefore compare the value of the project under consideration with other possible uses of funds.

2) Ask trainees to name their own most precious and irreplaceable resource. It is their own time. Ask trainees how they go about deciding how to spend their own time. Elicit the following points during discussion:

   Time is not usually valued in terms of money. We make decisions about spending time (i) by comparing the various alternative ways of spending it and (ii) by deciding that a particular way is the most enjoyable, profitable (or whatever particular quality we happen to value the most). In other words, the possible alternative uses for our time will largely determine our final decision.

The same applies to the way we spend money. Ask trainees what a private individual, or a co-operative society, is really comparing proposed expenditure with, when he is deciding whether to spend money.

Point out that money itself is of no value. What makes money valuable are the things which one can buy in exchange for it. Use the example of somebody with $100 in his bank account who decides to spend the $100 on a suit. Such a decision is based on comparing the "value" of the following alternatives:

- $100 at the bank plus whatever interest it might earn;
- the suit;
- any alternative ways of spending the $100 (trips, school fees, furniture, etc.).

When he decides to buy the suit, it shows that he values the suit most among the alternatives. The same applies when a co-operative decides to invest in a piece of equipment. Such a decision shows that the piece of equipment is more valuable to the co-operative than whatever else might have been done with the money. Investment decisions are therefore a matter of comparing alternatives.

3) Distribute the short case study and ask trainees to complete the assignment. Allow up to 30 minutes for this.

4) Reconvene trainees and ask them for their views. Focus the discussion on the costings and the figures that are brought up. Discourage comments on technical factors, which might or might not support the two five-ton vehicles over one ten-ton vehicle, but which are not relevant to the issues under consideration.

5) Trainees may generally agree with the manager and the committee. Ask them to identify the <u>real</u> reason for unwillingness of the manager and the committee to consider the ten-ton vehicle. They do not want to admit that they should have bought a ten-ton vehicle in 1979.

Ask trainees to recall examples of individual, co-operative, company or government institutions which have (i) continued to use outmoded equipment, or (ii) to work in an unsuitable location, or (iii) to follow inappropriate procedures, not because they could not afford to change, but because they could not accept that decisions today need not be affected by decisions yesterday.

6) Does a fashion conscious woman who buys a dress just before a change of fashion continue to wear it if she can afford to buy the latest design?

Should a manufacturer continue to use new but outmoded equipment even if the latest model is available, and can pay for itself through savings in operation?

Every culture and language has phrases such as "don't cry over spilt milk" or "that is water under the bridge".

Co-operative managers should observe the same principle when making investment decisions. Earlier expenditure may mean that money is not available at present, but that is all. Managers should not take into account "sunk costs" (costs which have already been made) or money that has already been spent, when making investment decisions. The possession of new but redundant assets must not influence decisions as to their replacement. Such replacement must be evaluated as an investment like any other and if it can earn a good return it should be carried out.

7) Depreciation is irrelevant to the Agrarian Farmers' Society's decision. The solution is as follows:

	Immediate Cost	Annual Cost
One additional five-ton vehicle	$ 15,000	$ 15,200
One ten-ton vehicle	$ 12,500 (net of trade-in allowance)	$ 14,500

It is clear that the purchase of a ten-ton vehicle will result in:

- an immediate saving of $2,500;
- an annual saving of $ 700.

The ten-ton vehicle should therefore be purchased.

The Transport Dilemma

The committee of the Agrarian Farmers' Society was unanimous. Early in 1979 the society had bought a five-ton lorry, and by early 1980 the demand for its services had already outstripped its capacity. The lorry was fully occupied collecting members' produce, bringing farm supplies from manufacturers and delivering processed crops to the Marketing Board. The manager had calculated that there was a need for at least a further lorry of the same size, and that most of the work involved large loads on fairly long trips. The representative of the vehicle supplier had suggested that the society should purchase a ten-ton vehicle to replace the five-ton one, rather than purchasing a second five-ton vehicle and operating two of that size. The representative also pointed out that the larger lorry was cheaper to run. The manager felt that it would be better to purchase another five-ton vehicle and to run two lorries rather than one. It seemed more sensible to keep the one-year old vehicle than to dispose of it so soon after its purchase.

The representative from the vehicle supplier produced the following comparative figures of operating costs for two five-ton lorries and one ten-ton lorry. The figures clearly favoured the purchase of the larger vehicle, in spite of insurance and taxation rates which were advantageous to the smaller ones.

	Ten-Ton	Five-Ton
Cost of Vehicle	$ 20,000 each	$15,000 each

Annual Cost of Operation:

Cost Item	One Ten-Ton	Two Five-Ton
Depreciation (five year life)	$ 4,000	$ 6,000
Fuel Costs	$ 8,500	$ 9,000
Drivers' Wages	$ 1,800	$ 2,400
Maintenance	$ 2,000	$ 2,000
Insurance	$ 1,000	$ 1,000
Tax	$ 1,200	$ 800
Total Costs	$ 18,500	$ 21,200

	Ten-Ton	Five-Ton
Total ton kilometres conveyed	400,000	400,000
Cost per ton kilometre	4.625 cents	5.3 cents

The manager was impressed by the figures and was aware that one larger vehicle would certainly do the work as easily as two smaller ones. He felt however that the representative's figures might be biased in favour of the larger figure. After all, his company stood to gain more from selling a ten-ton than a five-ton vehicle. The representative could offer a trade-in allowance of only $7,500 if the existing five-ton vehicle was traded for a new ten-ton lorry, since the five-ton model had been replaced by a newer version.

The manager was unwilling to recommend to the committee that they should take a loss of $7,500 on a vehicle which they had only purchased a year before. He examined the representative's figures and identified the critical flaw. The figures did not take into account either the losses on the sale of the old vehicle, or the continuing depreciation cost of the existing five-ton vehicle which would be kept unused if a ten-ton vehicle was bought. He noted the following alteration to the calculations.

	One Ten-Ton Vehicle	Two Five-Ton Vehicles
Total cost of operation	$ 18,500	$ 21,200
Add depreciation on existing five-ton vehicle	3,000	
Total costs	$ 21,500	$ 21,200
Cost per ton kilometre	5.375 cents	5.3 cents

He realised that the difference was only marginally in favour of buying a second five-ton lorry, but he felt that the figures convinced him that this was the right course. He had no doubt that the committee would support him as he was sure they would not be willing to sell, or lay up a vehicle that they had only bought a year before, and there was definitely no need for fifteen tons capacity.

He submitted the figures to the committee, and was pleased that they agreed with him. They proposed to purchase a further five-ton vehicle and the proposal was approved and an order was placed.

Assignment:

Was the Agrarian Farmers' Society Committee correct to purchase a second five-ton vehicle rather than one ten-ton vehicle as the representative had suggested? Justify your answer.

You should assume that there were no operational advantages to using two five-ton vehicles rather than one ten-ton vehicle.

SESSION 4.3

WHOSE BENEFITS?

Objective: To enable trainees (i) to distinguish between the various interests served by development projects and (ii) to identify the need for techniques to quantify as many aspects as possible.

Time: 1 to 2 hours.

Material: Tape Dialogue.

Session Guide:

1) Ask trainees to suggest whose interests any agricultural co-operative development project should serve. Summarise trainees' suggestions on the chalkboard/OHP. They will probably fall into two categories:

   (i) Vague statements such as

   - "The national interest"
   - "The needs of the community"
   - "The cause of development"

   These are correct but useless because nobody can say whether one project serves such a purpose better than another.

   (ii) Specific objectives such as

   - "To increase the income of the poorest 15% of the members"
   - "To increase food production by 15% in the XYZ region"
   - "To increase the surplus of the society by 25%

   Individual projects can be evaluated using these "specific" objectives. However, it is very difficult to use such objectives as "standards" for preparing, evaluating and appraising proposed projects.

Identify the resulting dilemma. Objectives are either too vague to be operationally useful, or too specific to be generally applied.

2) Play, or if a recorder is not available, enact the tape dialogue. Ask trainees to write down the objectives which each speaker is attempting to promote. If trainees wish, play the tape again. They should have a list of objectives reading as follows:

- to create employment;
- to earn foreign exchange through exports;
- to increase members' incomes;
- to benefit the poorer members of the society;
- to ensure a maximum surplus for the society;
- to produce a maximum amount of food;
- to develop resources which are presently underused.

3) Mention examples of projects which seem to conflict with one or more of these objectives. Such examples might include situations like these:

- A project which increases members' incomes very significantly, but whose benefits are confined to the richer and more successful members of the society, who are least in need of help.
- A project to mechanise a crop processing task at present carried out on the farm by the members and their families; members will then earn a large surplus and increased cash payouts but a substantial source of employment for members' families and others will be destroyed.
- A project which will increase production of an export cash crop; as a result however members are likely to devote less time and land to cultivation of staple food crops which are vital in providing balanced nutrition for their families.

4) Trainees may suggest various ideas for weighting different types of benefits. Stress that although quantitative techniques can help clarify the qualitative decisions which must be taken, no quantitative method can absolve a manager or any decision-maker from using his own judgement.

Tape Dialogue

Narrator: The manager of the Agrarian Farmers' Society was annoyed and disappointed. The committee was discussing the egg grading project for the first time and every member seemed to have a different argument against it. What was worse, all arguments seemed to be quite convincing and he felt that all his preparatory work would be wasted. The president had discussed the project with the manager before the meeting and he was equally surprised. He decided that nobody would change his mind at this meeting and he attempted to draw the proceedings to a close.

President: Fellow co-operators, I am sure we have had a most enlightening discussion. Your comments have certainly given me, and I suspect our manager, a great deal of food for thought. One thing is certain, more work must be done on this proposal before we can submit it to you again.

Could I ask each of you to summarise your arguments against the proposal, so that we can be clear where we stand. Mr. A, perhaps you would like to start.

Mr. A: Certainly, thank you Sir. My objective is quite simple. Our members and all the people around here need jobs more than anything. The poultry unit will create a few hours' work for the children and a couple of jobs here in the grading and packing station. Surely we must find something else which will really create jobs, on the farm and in the society. How about building a road? We could get money from the government to help, and employ hundreds of people for months.

President: Thank you Mr. A, that's certainly very clear. What about you, Mr. B?

Mr. B: I am no economist, but all I read about in the papers is "balance of payments" and "exports". With the money and effort that would go into this poultry thing, we could in-

crease members' production enormously, and the society's output of coffee. Every kilogram would go for export. That would benefit the country and not just a few spoilt rich people in the city who want eggs of a particular type.

President: Thank you, I must admit you have a point. What are your opinions, Mr. C?

Mr. C: Our job is to serve our members, and that means helping them make more money. These petty little chicken houses are chicken feed, if you will excuse the joke. We need big projects, which our more progressive members will really be able to turn into money spinners. In that way they and their society will grow rich, and the whole region and nation will benefit.

President: That's certainly frank enough, I gather you do not agree, Mrs. D?

Mrs. D: I certainly don't. I am against the poultry project for quite different reasons however. I think our rich members will be able to make more out of the scheme than the poorer ones, and that's just what I'm against. Our job is to help the least fortunate in the community. Any funds we have should be given to education, to helping the landless to get some fields to plant, or should even be distributed in the form of food to those who are wholly destitute. The co-operative should not be helping the rich to get richer by producing eggs for the privileged.

President: Thank you, that's difficult to reconcile with Mr. C's view, but it's another point of view we have to take into account. What were your objections, Mr. E?

Mr. E: I think we are all being far too high-minded and complicated. Our job as committee members of a co-operative society is to help the society make as much money as pos sible. Members will benefit in the end, and they elected

us not to try to work out what is best for any particular group of members, but to do what is best for the society. That means making as big a surplus as we can. It seems to me that the egg project will have a pretty thin margin after we have paid for the eggs and your city traders have taken the margins they are used to. A few extra breakages and it will be in the red. Let's invest more money in farm supplies. We can undercut the local traders by a cent or two and make far more money, far more easily, than by messing about with eggs.

President: You make it all sound very simple, and maybe you're right, Mr. E. Mrs. F, how do you feel?

Mrs. F: My view is even simpler, but no more favourable for the poultry scheme. Food is our national problem and the society must devote all its energies to producing more food for the nation. A few non-indigenous poultry, raised on imported feed in houses of foreign design are not going to solve our problems. If our members think that they can sell eggs for a good price, their children won't ever get eggs to eat and the first effect will be a great increase in malnutrition. Let's help members realise what a wonderful source of food they have.

President: "Food to eat" certainly seems basic enough, and some of our members and the landless people around here could do with more of it. What do you feel, Mr. G?

Mr. G: As I see it, the society is meant to help development. I take that to mean opening up new land and making better use of idle resources. I don't think the egg project will do that since the chickens, their houses and even the feed will be brought from outside our area, and a lot of it from abroad even. Shouldn't we help our members, and the country, by putting a new irrigation scheme in, or clearing the bush on the hillside to open up new land? That would provide employment for the people and help them to make the best use of what they already have. That's development, surely?

President: Well, we've heard a great many opinions, and none in favour of the poultry scheme. Maybe we really don't know what we're trying to achieve in this society. I suggest that before the next meeting we should look at our bylaws again, and compare them with the minutes of this meeting. Let's list all the legitimate objectives that have been put forward by members this afternoon, and then try to decide how we should direct our affairs in the future. That way we can achieve consistency.

Members: A good idea. We'll do that.

SESSION 4.4

VALUATION PROBLEMS

Objective: To enable trainees (i) to explain the reasons for simple adjustments to price figures in project appraisals (shadow prices), (ii) to make such simple adjustments to price figures for use in project evaluations and (iii) to interpret results from project appraisals based both on adjusted and non-adjusted price figures.

Time: 3 to 32 hours.

Session Guide:

1) Remind trainees of the apparently conflicting project objectives identified in the previous session. Elicit from them and list on the chalkboard/OHP the following problems which may occur if projects are approved on purely financial terms.

   - Less jobs will be created, or employment opportunities may actually be destroyed.
   - Products destined for export markets may be neglected in favour of products with no positive effect on the balance of payments.
   - The richer members of the society may benefit disproportionately from projects whereas poorer members (and landless non-members) may gain nothing, or even suffer.
   - The society's surplus may be maximised to the detriment of members' direct incomes.
   - Food production may suffer, or may not be maximised.
   - Existing underutilised resources such as uncleared land may not be brought into production.

2) Explain that if the price mechanism operated perfectly, investments would automatically be made in projects which would optimise benefits to the society.

However, this does not always happen. Ask trainees for examples of prices in their country which would change if there were no government controls. Examples may include:

- some staple food prices (may go up)
- minimum wages (may go down)
- official foreign exchange rate (may go down).

Ask trainees what effects such changes might produce (assuming they took place):

- food prices: people would initially buy less, but the higher price might encourage farmers to grow more; the increased supply might bring prices down again;
- wages: more people would be employed;
- foreign exchange: imports and foreign travel would become more expensive, so less spending on these.

Since actual prices for labour, foreign exchange, food products, etc., do not often reflect the "true" value of these items, project analysts very often "adjust" such prices when appraising projects. Such adjusted prices which are a more accurate reflection of the true value of the items they represent, are called "shadow prices".

3) The technique of shadow-pricing gives co-operative project analysts the opportunity to appraise the effects of projects on issues which are important in a co-operative context, such as:

- employment
- exports (earning or saving foreign currency)
- income distribution
- society versus members income
- food production
- underused resources

a) <u>Employment</u>

Ask trainees to suggest what would be the lowest amount for which an unemployed, unskilled person in their area would be

willing to work. Compare this with the lowest wage paid by the society.

Minimum wages are set by government, or by employers, usually at levels well above the rate for which people would actually be willing to work.

Ask trainees to suggest the effect of this "artificially" high wage rate on the creation of employment. Clearly, fewer jobs will be created than if wage rates were lower.

Using actual but artificially high wage rates to appraise "labour-intensive" projects may mean that decision-makers do not consider the project. In such projects, analysts therefore adjust wage rates so that labour is valued, not at its actual and artificially high rate, but at a rate which is a better reflection of the true value of labour.

b) Exports

Ask trainees how much they could sell a $100 note for on the black market. Compare this with what such a note could be sold for in the bank. What does this tell us about the official rate of exchange?

In most countries the value of the currency against other currencies is kept above its "free market" value by a variety of devices which restrict free trading in currency. These include exchange controls, limited travel allowances, import licences and export taxes.

Use the following example to show the effect of controls of this sort (modify if possible to incorporate actual "black market" and "official" rates of exchange in the trainees' country).

- Official Rate - 15 DC Units = $ 1 USA
- Black Market Rate - 25 DC Units = $ 1 USA

If the world price of a society's produce is $1,000 per ton, how much will the society receive in DC Units when a ton is sold and the dollars exchanged at the official rate?

- $1,000 x 15 DC Units = 15,000 DC Units.

How much would the society have received if the rate of exchange had been allowed to be a "free" reflection of the supply and demand for the currency?

- $1,000 x 25 DC Units = 25,000 DC Units.

If the price of a piece of machinery is $1,000 USA, how many DC Units will the society have to pay in order to buy $1,000 with which to pay for the machine?

- $1,000 x 15 DC Units = 15,000 DC Units.

How many DC Units would the society have had to pay if they had bought the dollars on a free uncontrolled market?

- $1,000 x 25 DC Units = 25,000 DC Units.

Ask trainees to suggest the effect of such controls on a society's willingness to:

- produce export crops;
- purchase imported equipment or other items.

Clearly the society will be <u>less</u> likely to produce for export and <u>more</u> likely to purchase imported equipment, than if the rate of exchange was the same as the unofficial rate.

Ask trainees why rates of exchange are controlled:

- to keep down the local prices of essential imported foodstuffs, medicines or other items;

- to preserve the value of the currency for reasons of national prestige.

Many authorities believe that controls of this sort are inappropriate. But they do exist, and project analysts should make some adjustment to export prices and import costs.

c) <u>Income Distribution</u>

Ask trainees to estimate the following figures:

- the average monthly income of the ten richest members of their society;

- the average monthly income of the one hundred poorest members of their society;
- the average monthly income of landless unemployed non-members in their community.

Has this inequality increased, decreased or remained the same during the last ten years?

- What effect has the co-operative society had on the distribution of income?
- What effects do projects currently being considered, or implemented, by the society have on income distribution?

People who already have more money than average in a community are almost always those who are most likely to benefit from any new project.

- They are better educated and very often have more experience of new practices and machines.
- They can afford to take risks which might be too dangerous for people who are close to destitution.
- They may have become richer through inborn qualities of energy and initiative.
- They are likely to be more healthy and optimistic and thus able to work hard on new projects.

Should a co-operative society select projects which help the poorer members, and even non-members, even if this means less total revenue for the society and its members? If so, how can adjustments be built into analysis of projects?

- Agricultural co-operative societies should be organised in such a way that all farmers, and not only the most successful, benefit from membership and play some part in directing its affairs.
- One could "shadow-price" the benefits from the project by counting likely increased incomes for poorer people as being worth more than similar amounts which would accrue to richer people.

Ask trainees to imagine two co-operative mechanisation projects:

A. To purchase two large tractors which will be used mainly by the wealthiest farmers who have large landholdings.

B. To purchase 20 hand-driven power tillers, which will be hired mainly by poorer members for their small farms.

If both have identical financial results, which should be selected?

Most trainees will select project B. Ask them which of the two they would select if project A earned a 1% higher surplus for the society. Raise the figure until trainees swing to project A. Point out that they are in fact using "shadow prices" if they prefer a project which benefits poorer farmers, even if the alternative earns a larger surplus. Point out, however, that if a society is equitably directed and employment is favoured, as suggested earlier in the session, the interests of poorer members and non-members will be well served.

d) <u>The Society or its Members</u>

Ask trainees whether an average member of their society <u>really</u> regards increases in the income and capital of his society as a benefit to himself.

Some members may argue that their societies should redistribute all surplus, since the society has no right to determine how "their" money should be used. Can every co-operative manager claim that the ways in which undistributed surplus is used in his society are <u>always</u> better for members than if the money was given back to them?

Ask trainees whether the margin between buying and selling prices of produce can be set by society management. On those products where management does have some discretion, are prices offered to members as high as they could be?

Ask trainees which of the following projects should be selected, all other factors being equal. Write the project details on the chalkboard/OHP.

- Project A: Estimated increased income to one hundred members $90 per member = $9,000. Estimated increased surplus to the society = $1,000. Total Benefit $10,000.

- Project B: Estimated increased income to one hundred members $10 per member = $1,000. Estimated increased surplus to the society = $9,000. Total Benefit $10,000.

If all the surplus was automatically redistributed on a patronage basis, there would be no difference.

But a proportion of the surplus is always retained for "education" and "reserves". Which project is better for the society?

If trainees select one or the other, alter the figures in favour of the less preferred alternatives, to stress the point that such a preference implies a higher "valuation" for members', or for the society's income.

If possible, projects should be designed to maximise members' income. Societies' surplus should be limited to a level which pays for the equipment invested in the project, and allows a margin for contingencies. Projects such as B should in general not be put forward.

e) Food Products

Ask trainees to consider the following situation. A national government was anxious to increase exports. The small farmers used most of their land for beans and cassava which were consumed at home, but co-operative societies were encouraged to persuade them to change to coffee for export. There was not much demand for beans or cassava since most farmers grew enough to satisfy their own needs. The export market prices for beans and cassava were low. On the basis of these prices, it was more profitable to sell coffee and buy food. However, when the farmers stopped growing beans and cassava for their own consumption, they all needed to buy these staples from the

market. Prices rose dramatically and the farmers were far worse off than before. Ask trainees how this situation might have been avoided.

- Government officials should have anticipated the results of increased demand and reduced supply of food crops.
- An adjusted (shadow) price could have been used for food crops grown and consumed on the farm. This would have corrected the unnaturally low market price which resulted from the very "thin" market.

f) Underused Resources

Ask trainees if they know of co-operative societies that have plenty of uncleared land, or land which could produce more if irrigated, but where nothing is being done to exploit the potential because the society invests its funds in short term projects, or in projects which do not involve the use of new land. Why is this so? How can it be avoided?

Ask trainees whether land can be freely bought and sold at a price approximating the free market value in their areas. If not, why not?

Land is often overpriced, or not priced at all, because it is communally owned, unregistered or customarily belongs to people from one particular group. How can a co-operative society value land of this sort which must be used in a co-operative project?

Land may be valued at the price charged in neighbouring areas for land of similar quality for which there is a reasonable market.

An annual figure for equivalent rent may be used if land cannot actually be purchased, or if prices are ridiculously low or high.

The value of whatever else might be done with the land can be used as a regular charge to the project.

Example: A co-operative society has the choice:

- to grow maize on a piece of land, or
- to build a co-operative shop on it.

When appraising the co-operative shop, the yearly net returns from the maize crop can be used as yearly rent for the land.

If land would otherwise not have been used at all, it may reasonably be included at no cost.

Major land clearing, reclamation or irrigation projects clearly involve large immediate investments and delayed returns. Techniques exist for taking some account of the timing of costs and benefits, and these will be dealt with in the following session.

4) Real Prices versus Shadow Prices

Repeat that the adjusted values for labour, foreign exchange, food products, and so on, are called "shadow prices".

Ask trainees to suggest why this name is used:

- they are not "real prices" and they are used in project appraisal only to ensure that projects which are socially preferable but maybe financially less profitable, are selected when appropriate.

Ask trainees if the use of shadow prices in the appraisal of a project will affect the operation of the project if it is selected and implemented:

- the project may be selected because shadow prices were used, but the actual results will depend on real prices only.

Ask trainees how the use of shadow prices will affect the final results a society may obtain from an appraised project:

- the financial results will be worse than they would otherwise have been, because the society will have chosen projects for their social rather than their financial benefits.

Ask trainees whether a society should use shadow prices in appraising projects.

Shadow prices are usually used by government planners and development bankers when deciding on major projects. There is however no however no reason why a co-operative society should not use them internally, provided that:

- the committee and other decision makers understand what they are doing, and are ready to accept less than optimum financial results;
- the financial implications of any project are computed in real prices as well as in shadow prices, to ensure that the real return is high enough to repay the loan, pay a surplus, etc.

SESSION 4.5

THE COMPARISON OF COSTS AND BENEFITS

Objective: To enable trainees (i) to tabulate the costs and benefits associated with a project, (ii) to evaluate and compare projects by traditional methods and (iii) to identify the need for a method which takes account of differences in timing.

Time: 2 to 3 hours.

Material: Exercise: "The Grain Storage System".

Session Guide:

1) Remind trainees of the importance of collecting appropriate and relevant data, of making the necessary forecasts and of making adjustments to market values of items such as export prices or wage payments.

2) Distribute the exercise to trainees and ask them individually to adjust those figures which in their opinion should be changed to take account of non-financial factors. Allow up to half an hour for this. A possible set of answers is as follows:

Items to be Considered for Adjustment	Actual Adjustment	Explanation
Cost of Wasted Grain	No change	New high prices are likely to reflect the real value.
The Cost of Unskilled Labour	Divide by two	Wages at which unskilled labourers would be prepared to work likely to be lower than the minimum official wage rates because there is high unemployment.
Cost of Land	Eliminate	The land is at present unused, and the money will be at the disposal of the society in any case.
Imported Equipment	Double	The unofficial rate likely to reflect the "true" rate of exchange.

Opinions may differ in nearly every case. The specific changes are less important than trainees' appreciation of the need for adjustment of these costs. Discuss what changes might be appropriate for similar figures in trainees' own country, i.e. considering the foreign exchange and employment situation there.

Emphasise once again that shadow prices should only be used in project appraisal. The real prices will determine the final results of the project, and a society may choose projects which are less profitable than others if it uses shadow prices.

In this case the manager of the Agrarian Farmers' Society must carefully explain why and how he is adjusting the figures, if he proposes to do so.

3) Ask trainees, again individually, to complete the second part of the exercise. Stress the importance of neat layout and systematic presentation, and circulate among the trainees, giving guidance where necessary. In particular, they may need help with identifying the starting point ("year zero") and in determining what the benefits are.

After one and a half hours collect trainees' written answers and display the following on the chalkboard/OHP:

Time	Concrete Bins	Unadjusted	Adjusted	Mechanised System	Unadjusted	Adjusted
Start Point (one month from decision to proceed)	Land Purchase	($ 1,000)		Cost of System	($ 20,000)	($ 40,000)
During Year 1	Cost of Bins	($ 15,000)	($ 15,000)	Skilled Labour	($ 2,000)	($ 2,000)
				Unskilled Labour	($ 400)	($ 200)
				Maintenance	($ 1,500)	($ 1,500)
				Reduced Losses	$ 16,000	$ 16,000
End of Year 1	Cost of Conveyer	($ 3,000)	($ 6,000)			

Time	Concrete Bins	Unadjusted	Adjusted	Mechanised System	Unadjusted	Adjusted
Year 2 and therafter	Reduced Losses	$ 10,000	$ 10,000	Reduced Losses	$ 16,000	$ 16,000
	Wages	($ 4,000)	($ 2,000)	Wages	($ 2,400)	($ 2,200)
	Repair and Maintenance	($ 500)	($ 500)	Repair and Maintenance	($ 1,500)	($ 1,500)
End of Year 6	New Conveyer	($ 3,000)	($ 6,000)			

This example is deliberately rather complex, in order to ensure that trainees grasp (i) the necessity for clear identification of relevant cash flows and (ii) the times at which they occur. If it appears likely that trainees will find difficulty in identifying and laying out the figures, the socio-economic adjustments may be omitted or only discussed after the table of unadjusted costs and benefits has been settled. It is vital that every trainee is able to identify and lay out the figures before proceeding to discounting techniques.

Trainees may believe that it is necessary to present data for an indefinite period. The example above stops at year ten. Replacement conveyers will be needed every five years and complete mechanised systems every ten. With these replacements both systems might be expected to last indefinitely. This is not necessary. Circumstances and technology change very quickly, and any forecast beyond ten or at the most twenty years is extremely hazardous. Stress that decisions about future replacement should themselves be the subject of project appraisals. So-called "projects" are not isolated activities which begin and end. They are artificially separated activities which form part of the total operation of an enterprise, and must be appraised over the long term as such.

4) Ask trainees to decide which alternatives should be chosen by the AFS. Prevent any trainees already familiar with discounting techniques from introducing them at this stage, since the objective is to test the use and identify the weaknesses of more traditional

methods of appraisal, such as "pay back period" or "annual return".

Ask trainees to "vote" for one project or the other. Askthem to explain their preferences. Clearly the saving is greater with the mechanised system, while more people will be employed and less capital needed for the concrete bins. These arguments must be related to one another in some way, since neither employment, capital saving nor loss prevention are justified at just any price. The benefit must be proportionate to the cost.

Trainees may use the adjusted or the unadjusted figures. If both are used, it is possible to compare the projects by asking the following questions.

Which project repays the original investment the quickest?

Concrete Bins	Unadjusted	Adjusted
Initial Investment	$ 19,000	$ 21,000
Net Annual Benefits	$ 5,500	$ 7,500
Pay Back Period	3.45 years	2.8 years
Mechanised System		
Initial Investment	$ 20,000	$ 40,000
Net Annual Benefits	$ 12,100	$ 12,300
Pay Back Period	1.65 years	3.25 years

On this basis, using the adjusted figures, the mechanised system is better, but using the adjusted figures however, the concrete bins system pays for itself more quickly. Ask trainees what critical factor is omitted when using this method of comparison. The results of the project, after the initial investment has been removed, are totally ignored.

Which project produces the highest net surplus over (say) the first ten years of its life?

Item	Concrete Bins		Mechanised System	
	Unadjusted	Adjusted	Unadjusted	Adjusted
Total Benefit	$ 90,000	$ 90,000	$ 160,000	$ 160,000
Total Costs	$ 62,500	$ 49,500	$ 59,000	$ 77,000
Total Surplus	$ 27,500	$ 40,500	$ 101,000	$ 83,000

On this basis the mechanised system is preferable, whether the figures are adjusted or not. Ask trainees to identify ways in which this method of comparison is deficient. The relationship between the amount of the initial expenditure and the benefit is ignored. Clearly a large investment can be expected to generate a larger surplus, but the analyst is more interested in the rate of return on the investment, than in the total amount of the return.

Which project produces the highest annual return, measured as the ratio of the annual benefit to the initial investment?

Item	Concrete Bins		Mechanised System	
	Unadjusted	Adjusted	Unadjusted	Adjusted
Initial Investment	$ 19,000	$ 21,000	$ 20,000	$ 40,000
Net Annual Benefit	$ 5,500	$ 7,500	$ 12,100	$ 12,300
Percentage Return	28.9%	35.7%	60.5%	30.7%

On this basis, using the unadjusted figures, the mechanised system is preferable, but the concrete bins yield a higher rate when the adjusted figures are used. Ask trainees to comment on this method of comparison. It is impossible to take account of variations in annual benefits, or isolated investments after the initial expenditure has been made. Neither is any adjustment made for the timing of the benefits or costs.

Illustrate these deficiencies by using examples from the schedule of costs and benefits.

- The mechanised system requires the full investment to be made from the beginning, while the investment in concrete bins is spread over the first year. The money could then be used for some other purpose, such as earning interest, before it is spent.

- The concrete bins require a new conveyer in year 6. The ordinary rate of return figure cannot take this into account.

5) After this session the trainees should realise that a more effective method of comparison is needed. They should nevertheless appreciate that when they identify and time the relevant cash flows, and compare them as they have learned to, then they are applying techniques which are more sophisticated and systematic than those normally used in most organisations.

The Grain Storage System

The Agrarian Farmers' Society had to install new grain handling and storage facilities. The problem was what type of equipment should be installed.

At that time the grain was stored on the earth floor of a covered barn open to vermin and damp. Thus there were losses of about 5% on all grain passing through the stores. Although this wastage rate had always been considered excessive, it became intolerable at the new government guaranteed price of $100 per ton of grain.

The growing population required more food, and existing standards of nutrition were poor, therefore the government was anxious to encourage high production of locally consumed foodstuffs of all kinds, including grain.

The manager estimated that about 4,000 tons of grain passed through the society's store every year. The intention was to install a system which would receive and deliver the grain, and also store it for whatever period was necessary. The maximum amount to be stored at any one time was about 1,000 tons. The maximum capacity for receiving or delivering grain had to be 20 tons per hour.

Two possible methods had been identified, one of which involved the construction of a set of specially designed concrete bins. Each bin would hold 200 tons. The grain would be shovelled directly into the bins from lorries, and a portable conveyer belt would be purchased. This belt could be moved from one bin to the other and could deliver grain to customers' transport at the required rate of 20 tons an hour when necessary. This conveyer belt was locally manufactured, mostly with imported materials and components. The cement for the bins was locally made.

The manufacturer of the conveyer had a substantial export business to neighbouring countries, and was thus permitted to import the necessary materials. Foreign exchange for imports was generally very hard to obtain. Essential agricultural equipment could be imported on special licence only, as could medicines, books and a few other things. There

was a substantial illicit trade in import licences and foreign exchange. The illegal foreign exchange rate for local currency was said to be around half the official rate of exchange.

If the bin system was chosen, further bins and the necessary conveyers could be installed as required. However, the bins would take about 13 months to construct, because of cement delivery problems and the size of the construction task. During this period the existing losses would continue.

The cost of the bins was $3,000 each. The land on which they were to be built was owned by a trust which had been left to the society by a wealthy member. The society would have to pay $1,000 to the trust for the land, which could then be used for any purpose which the committee of the society believed to be for the benefit of members. This sum would have to be credited to the trust account as soon as construction started. The cost of the bins would be paid during the period of construction. The conveyer would be paid for when the whole system was commissioned and the conveyer was installed.

Four people would be employed full-time for receiving, storing and delivering grain. They would be paid the official minimum wage for unskilled labour, $600 a year. A further eight part-time workers would be needed at harvest time. They would be paid on average $200 a year each. There were many landless people in the area and the manager was always being asked to provide jobs of any sort for relatives and friends of members. It was known that plenty of people were waiting and prepared to take part-time jobs on farms for $300 a year.

The portable conveyer would cost $3,000. Fuel, spares and repairs would cost about $500 a year. This conveyer could be expected to last about five years, after which it would have to be scrapped and replaced with a similar machine.

The storage bins could be expected to last almost indefinitely and would need no repairs if they were constructed according to the specifications. This system would reduce losses by half to 2 1/2%.

The alternative was a far more modern mechanised system using fixed screw conveyers and a special large capacity steel silo which could hold 1,500 tons of grain. This system would reduce losses to 1%. Because of the height of the silo, a disused corner of the storage yard would be suitable for its installation, since it would occupy very little ground space.

The modern system could be operated by one specially trained worker and a mechanic. People with this experience were in short supply and they would have to be paid $1,000 a year. Two further part-time labourers would be required during the harvest season, and would have to be paid about $200 a year each. Routine replacement of high wearing components would be necessary. Spares, repairs and fuel would cost about $1,500 a year including this. The manufacturer stated that the complete system could be expected to last about ten years, after which it would probably require almost total replacement.

The mechanised system was imported from abroad. Stocks were available locally for immediate delivery and the total cost, including the necessary foundations and installation, would be $20,000. The complete system could be installed and ready to operate in a month. The total price would have to be paid on completion. Whatever system was installed, the co-operative bank was willing to advance the necessary funds to cover the capital cost.

Assignment :

1) Which costs or benefits should be considered for adjustment for social or economic reasons? What specific adjustments should actually be made?

2) Lay out a schedule and timetable comparing the costs and benefits associated with each project, showing the cash flows each year starting from the first cash movement in earliest project.

3) Advise the manager of the Agrarian Farmers' Society as to which alternative should be selected.

SESSION 4.6

THE PROBLEM OF TIMING

Objective: To enable trainees (i) to appreciate the need for taking some account of the timing of costs and benefits and (ii) to construct and use simple discount tables for this purpose.

Time: 2 to 3 hours.

Material: Tables Al and A2, taken from Gittinger, Economic Analysis of Agricultural Projects, published by the John Hopkins University Press for the World Bank in 1972.

Session Guide

1) Ask trainees whether they would prefer to receive $100 today or in a year from today. They will all choose to have the money today. Ask them why.

- They may fear they will not get the money in a year's time. If it is offered today, it is certain. They are concerned about RISK.
- They may believe that $100 received in one year's time may not be worth as much in purchasing power as the same amount received today. They are concerned about INFLATION.

Ask trainees whether there are any other factors which lead them to choose money today rather than later. Ask them what they would do with the money if they received it today.

- Some would buy something they need and would enjoy immediately.
- Some would put the money in a savings bank and earn interest on it.
- Some would invest the money in their farm or in some other activity, in the hope of getting a return on the investment.

In every case they would be making an immediate use of the money. Money available to them now can be used now. Money available in a year's time can only be used in a year's time. In other words, they are concerned about the USE of the money.

2) Ask trainees to imagine that you are conducting an auction. You are selling $100 in cash. It will be given in 12 months' time to whoever is willing to pay the most for it today. Trainees should ignore inflation and assume that the vendor is 100% honest and secure and that the money really will be given as promised. Each trainee should write on a piece of paper a "sealed bid" of the amount he is willing to pay.

- When all trainees have written down their figure, say that you are now selling $100, again inflation proofed and completely secure, but to be given two years from today. They should write down how much they would pay for this "promissory note" today.

- Follow this with similar auctions of $100 to be given three, four, five, six, seven, eight and nine years from today. Ensure by inspection that all trainees understand what they are being asked to do, so that all will end up with a "personal discount table" showing how much $100 at the end of one, two, three, ...nine years is worth today.

- Ask trainees to read out their figures. Ensure that all figures are less than $100 and that all the tables decrease as the number of years increases. Explain the reasons for these "rules" to any trainee who has missed the point so far.

- Some trainees will have higher figures than others. After awarding the "prize" to the highest bidder at the one year point, ask trainees to explain why everybody has not chosen the same rate. The greater the discount that an individual applies to a sum to be received in the future, the more he values the use he thinks he can make of the money in the intervening period.

Example:

Somebody who is prepared to offer $99 now (small discount) for $100 in a year, values the use he thinks he can make of the money during that year at $1.00.

Somebody who is prepared to offer only $85 now (considerable discount) for $100 in a year values the use of the same money during that year much higher, i.e. at $15.

3) Distribute Table Al and show that this is a mathematically calculated version of the personal table which each trainee has constructed for himself. Ask trainees to estimate the rates of interest they have applied in their own "bids" for $100 to be received in one year, five years' and ten years' time. Show the inconsistency of using different discount rates, unless there are particular circumstances making money received at one date more active than at another date.

- Explain the very low figure in the lower right hand quadrant of Table Al. Show trainees that their personal discount rates would produce similarly low figures if extended to twenty and more years.
- Show trainees that the table could be used as a "Ready Reckoner" in any future auction of the type just conducted. The "bidder" has only to choose a discount rate and he can then calculate his bid for any number of years. Ask trainees to calculate bids on $100 for various future dates at the discount rates they prefer. Make sure that all have full understanding of the table.

4) Ask trainees to participate in a variation of the first auction. On this occasion they are to bid, at their preferred discount rate, for an amount of $100, to be paid annually over the next three years, starting from today, making a total of $300 altogether. Trainees may try to make estimates as in the first auction, but some will realise that all they need do is add the figures for individual years in Table Al at the chosen interest rate. Ensure that all trainees understand this principle. Ask for bids for four and five years of continuous income flow to ensure that all grasp what is involved.

- Distribute Table A2 and explain that the figures in this table are the same as those they used when making their bids in the last auction. Ask trainees to bid for $100 to be received every year for various numbers of years, at their preferred interest rate, to ensure that they understand the use of Table A2.

5) Ask trainees whether an organisation such as a co-operative society, should discount future income in the same way as they have been doing as individuals.

A society can use money by depositing it in a bank where it will be completely secure and will also earn a certain rate of interest. Any project must therefore earn at least as good a rate of interest as a deposit account at the bank. The discount tables can be used to ensure that all projects achieve at least this minimum. The tables can also be used to pick out those projects which yield the highest return.

Remind trainees that it is preferable to adjust the figures used in the projects to take account of the employment, foreign exchange and other factors discussed in the previous session. If this has been done, the project which yields the greatest return will be the one which most nearly achieves the objectives of the society.

Ask trainees to consider the following problem, which should be written on the chalkboard/OHP.

There are three possible investments a society can make with $1,000:

a) Deposit at the Co-operative Bank at 5% compound interest.

b) Project X which involves expenditure and income as shown below.

c) Project Y which involves expenditure and income as shown below.

	X	Y
Initial Investment	$ 1,000	$ 1,000
Income in Year 1	$ nil	$ 100
Income in Year 2	$ nil	$ 100
Income in Years 3 to 10	$ 100	$ 70
Salvage Value at End of Year 10	$ 1,000	$ 1,000

How should the money be invested?

Show trainees that Project X returns a total of $1,800 while Project Y returns a total of $1,760. Is project X therefore preferable?

Show that the discount tables take account of the different timing of the returns, and calculate the solution as follows. Use the 5% discount factor in order to compare both projects with depositing money at the bank.

		X	Y
Initial Investment		($ 1,000)	($ 1,000)
Discount Factor for Income Received During Year 1	0.952	$ nil	$ 95.20
Discount Factor for Income Received During Year 2	0.907	$ nil	$ 90.70
Discount Factor for Income Received During Years 3 to 10	5.864	$ 586.40	$ 410.48
Discount Factor for Income Received at End of Year 10	0.614	$ 614	$ 614
Net Total		$ 200.40	$ 210.38

Both projects are preferable to depositing in the bank at a rate of 5%, because both show a net positive value when future income flows are discounted at 5% (a similar calculation for the investment in the bank would have produced a nil net positive value).

Show that Project Y is to be preferred to Project X, in spite of its lower total of income undiscounted, since the discounted value is $ 9.98 higher than Project X.

6) Use further simple examples to check that trainees are familiar with the use of discount tables to calculate present values of future income. Show that <u>costs</u> as well as <u>benefits</u> must be discounted. The following example or other variants may be used.

A society wishes to ensure that all its projects yield at least 15% return. Which of the following projects should be selected?

	A	B	C
Initial Investment	$ 1,000	$ 10,000	$ 100,000
Income in Year 1	$ 100	$ 500	$ nil
Income in Years 2 to 5	$ 100	$ 1,500	$ nil
Income in Years 6 to 20	$ 200	$ 2,500	$ 30,000
Salvage Value at End of Year 20	$ nil	$ 1,000	$ 100,000

The solution should be discounted as follows:

		A	B	C
Initial Investment		($ 1,000)	($ 10,000)	($ 100,000)
Discount Factor for Income Received in Year 1	0.870	$ 87	$ 435	$ nil
Discount Factor for Income Received During Years 2 to 5	2.482	$ 248	$ 3,723	$ nil
Discount Factor for Income Received During Years 6 to 20	2.907	$ 581	$ 7,267	$ 87,210
Discount Factor for Income Received at the End of Year 20	0.061	$ nil	$ 61	$ 6,100
Net Total		($ 84)	$ 1,486	($ 6,690)

Only Project B should be passed, because only in this case does the present value exceed that of the original investment at the 15% discount rate.

Use more examples to ensure that all trainees can manipulate the discount tables and make the necessary simple calculations accurately. Demonstrate the importance of neat layout and methodical working, and stress that it helps avoid mistakes.

A-1. DISCOUNT FACTOR–How much 1 at a future date is worth today.

Year	1%	3%	5%	6%	8%	10%	12%	14%	15%	16%	18%	20%	22%	24%	25%	26%	28%	30%	35%	40%	45%	50%
1	0.990	0.971	0.952	0.943	0.926	0.909	0.893	0.877	0.870	0.862	0.847	0.833	0.820	0.806	0.800	0.794	0.781	0.769	0.741	0.714	0.690	0.667
2	0.980	0.943	0.907	0.890	0.857	0.826	0.797	0.769	0.756	0.743	0.718	0.694	0.672	0.650	0.640	0.630	0.610	0.592	0.549	0.510	0.476	0.444
3	0.971	0.915	0.864	0.840	0.794	0.751	0.712	0.675	0.658	0.641	0.609	0.579	0.551	0.524	0.512	0.500	0.477	0.455	0.406	0.364	0.328	0.296
4	0.961	0.888	0.823	0.792	0.735	0.683	0.636	0.592	0.572	0.552	0.516	0.482	0.451	0.423	0.410	0.397	0.373	0.350	0.301	0.260	0.226	0.198
5	0.951	0.863	0.784	0.747	0.681	0.621	0.567	0.519	0.497	0.476	0.437	0.402	0.370	0.341	0.328	0.315	0.291	0.269	0.223	0.186	0.156	0.132
6	0.942	0.837	0.746	0.705	0.630	0.564	0.507	0.456	0.432	0.410	0.370	0.335	0.303	0.275	0.262	0.250	0.227	0.207	0.165	0.133	0.108	0.088
7	0.933	0.813	0.711	0.665	0.583	0.513	0.452	0.400	0.376	0.354	0.314	0.279	0.249	0.222	0.210	0.198	0.178	0.159	0.122	0.095	0.074	0.059
8	0.923	0.789	0.677	0.627	0.540	0.467	0.404	0.351	0.327	0.305	0.266	0.233	0.204	0.179	0.168	0.157	0.139	0.123	0.091	0.068	0.051	0.039
9	0.914	0.766	0.645	0.592	0.500	0.424	0.361	0.308	0.284	0.263	0.225	0.194	0.167	0.144	0.134	0.125	0.108	0.094	0.067	0.048	0.035	0.026
10	0.905	0.744	0.614	0.558	0.463	0.386	0.322	0.270	0.247	0.227	0.191	0.162	0.137	0.116	0.107	0.099	0.085	0.073	0.050	0.035	0.024	0.017
11	0.896	0.722	0.585	0.527	0.429	0.350	0.287	0.237	0.215	0.195	0.162	0.135	0.112	0.094	0.086	0.079	0.066	0.056	0.037	0.025	0.017	0.012
12	0.887	0.701	0.557	0.497	0.397	0.319	0.257	0.208	0.187	0.168	0.137	0.112	0.092	0.076	0.069	0.062	0.052	0.043	0.027	0.018	0.012	0.008
13	0.879	0.681	0.530	0.469	0.368	0.290	0.229	0.182	0.163	0.145	0.116	0.093	0.075	0.061	0.055	0.050	0.040	0.033	0.020	0.013	0.008	0.005
14	0.870	0.661	0.505	0.442	0.340	0.263	0.205	0.160	0.141	0.125	0.099	0.078	0.062	0.049	0.044	0.039	0.032	0.025	0.015	0.009	0.006	0.003
15	0.861	0.642	0.481	0.417	0.315	0.239	0.183	0.140	0.123	0.108	0.084	0.065	0.051	0.040	0.035	0.031	0.025	0.020	0.011	0.006	0.004	0.002
16	0.853	0.623	0.458	0.394	0.292	0.218	0.163	0.123	0.107	0.093	0.071	0.054	0.042	0.032	0.028	0.025	0.019	0.015	0.008	0.005	0.003	0.002
17	0.844	0.605	0.436	0.371	0.270	0.198	0.146	0.108	0.093	0.080	0.060	0.045	0.034	0.026	0.023	0.020	0.015	0.012	0.006	0.003	0.002	0.001
18	0.836	0.587	0.416	0.350	0.250	0.180	0.130	0.095	0.081	0.069	0.051	0.038	0.028	0.021	0.018	0.016	0.012	0.009	0.005	0.002	0.001	0.001
19	0.828	0.570	0.396	0.331	0.232	0.164	0.116	0.083	0.070	0.060	0.043	0.031	0.023	0.017	0.014	0.012	0.009	0.007	0.003	0.002	0.001	0.000
20	0.820	0.554	0.377	0.312	0.215	0.149	0.104	0.073	0.061	0.051	0.037	0.026	0.019	0.014	0.012	0.010	0.007	0.005	0.002	0.001	0.001	0.000
21	0.811	0.538	0.359	0.294	0.199	0.135	0.093	0.064	0.053	0.044	0.031	0.022	0.015	0.011	0.009	0.008	0.006	0.004	0.002	0.001	0.000	0.000
22	0.803	0.522	0.342	0.278	0.184	0.123	0.083	0.056	0.046	0.038	0.026	0.018	0.013	0.009	0.007	0.006	0.004	0.003	0.001	0.001	0.000	0.000
23	0.795	0.507	0.326	0.262	0.170	0.112	0.074	0.049	0.040	0.033	0.022	0.015	0.010	0.007	0.006	0.005	0.003	0.002	0.001	0.000	0.000	0.000
24	0.788	0.492	0.310	0.247	0.158	0.102	0.066	0.043	0.035	0.028	0.019	0.013	0.008	0.006	0.005	0.004	0.003	0.002	0.001	0.000	0.000	0.000
25	0.780	0.478	0.295	0.233	0.146	0.092	0.059	0.038	0.030	0.024	0.016	0.010	0.007	0.005	0.004	0.003	0.002	0.001	0.001	0.000	0.000	0.000
26	0.772	0.464	0.281	0.220	0.135	0.084	0.053	0.033	0.026	0.021	0.014	0.009	0.006	0.004	0.003	0.002	0.002	0.001	0.000	0.000	0.000	0.000
27	0.764	0.450	0.268	0.207	0.125	0.076	0.047	0.029	0.023	0.018	0.011	0.007	0.005	0.003	0.002	0.002	0.001	0.001	0.000	0.000	0.000	0.000
28	0.757	0.437	0.255	0.196	0.116	0.069	0.042	0.026	0.020	0.016	0.010	0.006	0.004	0.002	0.002	0.002	0.001	0.001	0.000	0.000	0.000	0.000
29	0.749	0.424	0.243	0.185	0.107	0.063	0.037	0.022	0.017	0.014	0.008	0.005	0.003	0.002	0.002	0.001	0.001	0.001	0.000	0.000	0.000	0.000
30	0.742	0.412	0.231	0.174	0.099	0.057	0.033	0.020	0.015	0.012	0.007	0.004	0.003	0.002	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000
35	0.706	0.355	0.181	0.130	0.068	0.036	0.019	0.010	0.008	0.006	0.003	0.002	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
40	0.672	0.307	0.142	0.097	0.046	0.022	0.011	0.005	0.004	0.003	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
45	0.639	0.264	0.111	0.073	0.031	0.014	0.006	0.003	0.002	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.608	0.228	0.087	0.054	0.021	0.009	0.003	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

A-2. PRESENT WORTH OF AN ANNUITY FACTOR–

How much 1 received or paid annually for X years is worth today.

Year	1%	3%	5%	6%	8%	10%	12%	14%	15%	16%	18%	20%	22%	24%	25%	26%	28%	30%	35%	40%	45%	50%
1	0.990	0.971	0.952	0.943	0.926	0.909	0.893	0.877	0.870	0.862	0.847	0.833	0.820	0.806	0.800	0.794	0.781	0.769	0.741	0.714	0.690	0.667
2	1.970	1.914	1.859	1.833	1.783	1.736	1.690	1.647	1.626	1.605	1.566	1.528	1.492	1.457	1.440	1.424	1.392	1.361	1.289	1.224	1.165	1.111
3	2.941	2.829	2.723	2.673	2.577	2.487	2.402	2.322	2.283	2.246	2.174	2.106	2.042	1.981	1.952	1.923	1.868	1.816	1.696	1.589	1.493	1.407
4	3.902	3.717	3.546	3.465	3.312	3.170	3.037	2.914	2.855	2.798	2.690	2.589	2.494	2.404	2.362	2.320	2.241	2.166	1.997	1.849	1.720	1.605
5	4.853	4.580	4.330	4.212	3.993	3.791	3.605	3.433	3.352	3.274	3.127	2.991	2.864	2.745	2.689	2.635	2.532	2.436	2.220	2.035	1.876	1.737
6	5.795	5.417	5.076	4.917	4.623	4.355	4.111	3.889	3.784	3.685	3.498	3.326	3.167	3.020	2.951	2.885	2.759	2.643	2.385	2.168	1.983	1.824
7	6.728	6.230	5.786	5.582	5.206	4.868	4.564	4.288	4.160	4.039	3.812	3.605	3.416	3.242	3.161	3.083	2.937	2.802	2.508	2.263	2.057	1.883
8	7.652	7.020	6.463	6.210	5.747	5.335	4.968	4.639	4.487	4.344	4.078	3.837	3.619	3.421	3.329	3.241	3.076	2.925	2.598	2.331	2.108	1.922
9	8.566	7.786	7.108	6.802	6.247	5.759	5.328	4.946	4.772	4.607	4.303	4.031	3.786	3.566	3.463	3.366	3.184	3.019	2.665	2.379	2.144	1.948
10	9.471	8.530	7.722	7.360	6.710	6.145	5.650	5.216	5.019	4.833	4.494	4.192	3.923	3.682	3.571	3.465	3.269	3.092	2.715	2.414	2.168	1.965
11	10.368	9.253	8.306	7.887	7.139	6.495	5.938	5.453	5.234	5.029	4.656	4.327	4.035	3.776	3.656	3.544	3.335	3.147	2.752	2.438	2.185	1.977
12	11.255	9.954	8.863	8.384	7.536	6.814	6.194	5.660	5.421	5.197	4 793	4.439	4.127	3.851	3.725	3.606	3.387	3.190	2.779	2.456	2.196	1.985
13	12.134	10.635	9.394	8.853	7.904	7.103	6.424	5.842	5.583	5.342	4.910	4.533	4.203	3.912	3.780	3.656	3.427	3.223	2.799	2.468	2.204	1.990
14	13.004	11.296	9.899	9.295	8.244	7.367	6.628	6.002	5.724	5.468	5.008	4.611	4.265	3.962	3.824	3.695	3.459	3.249	2.814	2.477	2.210	1.993
15	13.865	11.938	10.380	9.712	8.559	7.606	6.811	6.142	5.847	5.575	5.092	4.675	4.315	4.001	3.859	3.726	3.483	3.268	2.825	2.484	2.214	1.995
16	14.718	12.561	10.838	10.106	8.851	7.824	6.974	6.265	5.954	5.669	5.162	4.730	4.357	4.033	3.887	3.751	3.503	3.283	2.834	2.489	2.216	1.997
17	15.562	13.166	11.274	10.477	9.122	8.022	7.120	6.373	6.047	5.749	5.222	4.775	4.391	4.059	3.910	3.771	3.518	3.295	2.840	2.492	2.218	1.998
18	16.398	13.754	11.690	10.828	9.372	8.201	7.250	6.467	6.128	5.818	5.273	4.812	4.419	4.080	3.928	3.786	3.529	3.304	2.844	2.494	2.219	1.999
19	17.226	14.324	12.085	11.158	9.604	8.365	7.366	6.550	6.198	5.877	5.316	4.844	4.442	4.097	3.942	3.799	3.539	3.311	2.848	2.496	2.220	1.999
20	18.046	14.877	12.462	11.470	9.818	8.514	7.469	6.623	6.259	5.929	5.353	4.870	4.460	4.110	3.954	3.808	3.546	3.316	2.850	2.497	2.221	1.999
21	18.857	15.415	12.821	11.764	10.017	8.649	7.562	6.687	6.312	5.973	5.384	4.891	4.476	4.121	3.963	3.816	3.551	3.320	2.852	2.498	2.221	2.000
22	19.660	15.937	13.163	12.042	10.201	8.772	7.645	6.743	6.359	6.011	5.410	4.909	4.488	4.130	3.970	3.822	3.556	3.323	2.853	2.498	2.222	2.000
23	20,456	16,444	13.489	12.303	10.371	8.883	7.718	6.792	6.399	6.044	5.432	4.925	4.499	4.137	3.976	3.827	3.559	3.325	2.854	2.499	2.222	2.000
24	21,243	16.936	13.799	12.550	10.529	8.985	7.784	6.835	6.434	6.073	5.451	4.937	4.507	4.143	3.981	3.831	3.562	3.327	2.855	2.499	2.222	2.000
25	22,023	17,413	14.094	12.783	10.675	9.077	7.843	6.873	6.464	6.097	5.467	4.948	4.514	4.147	3.985	3.834	3.564	3.329	2.856	2.499	2.222	2.000
26	22.795	17.877	14.375	13.003	10.810	9.161	7.896	6.906	6.491	6.118	5.480	4.956	4.520	4.151	3.988	3.837	3.566	3.330	2.856	2.500	2.222	2.000
27	23.560	18.327	14.643	13.211	10.935	9.237	7.943	6.935	6.514	6.136	5.492	4.964	4.524	4.154	3.990	3.839	3.567	3.331	2.856	2.500	2.222	2.000
28	24.316	18.764	14.898	13.406	11.051	9.307	7.984	6.961	6.534	6.152	5.502	4.970	4.528	4.157	3.992	3.840	3.568	3.331	2.857	2.500	2.222	2.000
29	25.066	19.188	15.141	13.591	11.158	9.370	8.022	6.983	6.551	6.166	5.510	4.975	4.531	4.159	3.994	3.841	3.569	3.332	2.857	2.500	2.222	2.000
30	25.808	19.600	15.372	13.765	11.258	9.427	8.055	7.003	6.566	6.177	5.517	4.979	4.534	4.160	3.995	3.842	3.569	3.332	2.857	2.500	2.222	2.000
35	29.409	21.487	16.374	14.498	11.655	9.644	8.176	7.070	6.617	6.215	5.539	4.992	4.541	4.164	3.998	3.845	3.571	3.333	2.857	2.500	2.222	2.000
40	32.835	23.115	17.159	15.046	11.925	9.779	8.244	7.105	6.642	6.234	5.548	4.997	4.544	4.166	3.999	3.846	3.571	3.333	2.857	2.500	2.222	2.000
45	36.095	24.519	17.774	15.456	12.108	9.863	8.283	7.123	6.654	6.242	5.552	4.999	4.545	4.166	4.000	3.846	3.571	3.333	2.857	2.500	2.222	2.000
50	39.196	25.730	18.256	15.762	12.234	9.915	8.304	7.133	6.661	6.246	5.554	4.999	4.545	4.167	4.000	3.846	3.571	3.333	2.857	2.500	2.222	2.000

SESSION 4.7

WHICH PROJECT? - DISCOUNTING EXERCISES

Objective: To enable trainees (i) to use discount tables in order to evaluate and compare simple projects, (ii) to calculate the net present value of such projects at set rates of interest and (iii) to calculate the internal rate of return on the projects.

Time: 2 to 3 hours.

Material: Exercise sheets and discount tables.

Session Guide:

1) If a significant interval has elapsed since the previous session, use simple examples to remind trainees of the basis and use of discount tables. Stress once again that the technique does not replace managers' judgement but merely makes project appraisal more systematic and focuses the analyst's attention on those factors which can be quantified.

2) Distribute the exercise sheet. Trainees should complete part a) on their own. Allow them up to one hour. Some trainees will be slower than others. Encourage trainees to help one another. En sure that all have completed at least the first question before reassembling the group for discussion.

3) Reassemble the group and go through each project. Attempt to elicit the correct answers from trainees, ensuring that those who are less confident have an opportunity to raise their doubts. By the end of the session all trainees should be able to complete at least a simple discounting task like those included in this exercise.

After trainees have had the opportunity to state and explain their calculations for each project, show the answers as below on the chalkboard/OHP.

a) Typewriter

Years	Dollars Out	Dollars In	10% Discount Factor	Net Movement
0	$ 1,000			($ 1,000.00)
1 to 5		$ 300	3.791	$ 1,137.30
End of 5		$ 100	0.621	$ 62.10

Net Present Value at 10% = + $199.40

Pick-Up

Years	Dollars Out	Dollars In	10% Discount Factor	Net Movement
0	$ 8,000			($ 8,000.00)
1 to 4		$ 2,000	3.170	$ 6,340.00
End of 4		$ 2,000	0.683	$ 1,366.00

Net Present Value at 10% = - $294.00

Security Fence

Years	Dollars Out	Dollars In	10% Discount Factor	Net Movement
0	$ 2,000			($ 2,000.00)
1 to 20		$ 230	8.514	$ 1,958.00

Net Present Value at 10% = - $42.00

Ensure that trainees understand the meaning of the figures. A project whose net present value is negative at a certain discount rate yields lower than that rate of interest (e.g. the pick-up and the security fence). One whose net present value is positive (e.g. the typewriter) yields more than a 10% rate of return.

4) Go through the figures for the tractor hire project. The second series of projects is rather more complicated than the first series. Stress the importance of identifying and timetabiing the cash flows before attempting to discount them. Trainees may not be able to estimate the rate of return, as opposed to calculating the net present value at a given rate. Explain the trial and error method used. It is not necessary or desirable to calculate more accurately than to the nearest one percent or so. Ask trainees why this is so. Tell them that the inaccuracies and approximations involved in forecasting costs and benefits for several years in advance are inevitable. An exact calculation of rates of return would give an erroneous, and even dangerous, illusion of precision.

The following answers should be shown on the chalkboard/OHP. Take the figures from trainees' own answers if possible.

b) Tractor Hire Service

Years	Dollars Out	Dollars In	28% Discount Factor	Net Movement	30% Discount Factor	Net Movement
0	$60,000			($60,000)		($60,000)
1						
2		$15,000	0.610	$ 9,150	0.592	$ 8,880
3 to 8		$30,000	1.684	$50,520	1.564	$46,920
End of 8		$15,000	0.139	$ 2,085	0.123	$ 1,845

Net Present Value at 28% = + $1,755
Net Present Value at 30% = - $2,355

Note: Income is calculated at net revenue at $10 per hour ($20 charge minus $10 running cost) less $15,000 per year fixed costs.

Note: The discount factor for years three to eight is calculated by subtracting the factor for two years from that for eight years in Table A2.

The rate of return is approximately half way between 28% and 30%, or about 29%.

Ask trainees to comment critically on this project. If necessary ask them whether the project could be economically implemented. Without more information, the maximum annual capacity of a tractor cannot definitely be stated, but if three tractors are capable of 4,500 hours two should achieve 3,000 and one should manage 1,500 hours. One tractor should therefore be bought each year, rather than three at once. Stress that common sense modifications of this sort can yield far greater returns than sophisticated analysis and calculations to several points of decimals.

$5,000 per year standing charges for the unemployed tractors would be saved. Ask trainees what other benefits this policy would achieve. Members' response to the single tractor service was too high or too low.

Whenever possible a project should be implemented in stages, so that information about future demand can be obtained before making a full commitment.

Ask trainees for other views on the projects. How does the rate of return compare with the typical interest rate on borrowed funds? Should the price per hour be reduced to ensure that members get more direct benefit? Should the surplus be redistributed to users of the tractor hire service, even if competitive private hire services or private ownership would be far more expensive?

5) Go through the figures for the Petrol Station and Hotel Projects as before. "Model answers" are as follows:

Service Station

Years	Dollars Out	Dollars In	10% Discount Factor	Net Movement	8% Discount Factor	Net Movement
0	$110,000			($110,000)		($110,000)
1	$ 5,000		0.909	($ 4,545)	0.926	($ 4,630)
2						
3						
4 to 10		$30,000	3.658	$109,740	4.133	$123,990

Net Present Value at 10% = - $4,805

Net Present Value at 8% = + $9,360

The Rate of return is slightly under 10%.

Hotel and Restaurant

Years	Dollars Out	Dollars In	Net	16% Discount Factor	Net Movement	18% Discount Factor	Net Movement
0	$50,000		($50,000)		($50,000)		($50,000)
1	$10,000	$10,000					
2 to 5	$10,000	$20,000	$10,000	2.412	$24,120	2.280	$22,800
6 to 10		$20,000	$20,000	1.559	$31,180	1.367	$27,340

Net Present Value at 16% = +$5,300

Net Present Value at 18% = +$ 140

The rate of return is thus very slightly over 18%.

6) Ask trainees whether a co-operative society should invest in projects such as petrol stations or hotels. Is it not better to invest any spare funds and managerial resources in projects of more direct benefit to members?

7) If necessary, set further simple examples to ensure that all trainees are able to complete simple discounting exercises of this type. The purpose of learning the techniques is twofold:

- To enable a manager to understand appraisals using this technique. He can then co-operate in the collection of data, and can comment on and criticise the completed appraisal with some knowledge of the principles on which it is based.

- To enable a manager, on his own initiative, to appraise societie's projects in this way. This may require educating committee members, or bankers, or other sources of funds. Trainees should therefore be able, not only to understand and use discounting techniques, but also to explain them to others who may be involved in projects approval. These others may be familiar only with the haphazard or politically motivated methods of decision making.

Discounting Exercises

The management and the committee of the Agrarian Farmers' Society had a lot of ideas for new projects which could benefit members, and the country in general. Funds, however, were limited. It was therefore necessary to select only those projects which would earn the maximum benefit in relation to the amount invested.

a) The management decided to consider only those projects that achieved a minimum rate of return of 10%. Money could be borrowed from the Co-operative Bank at this rate of interest, and it seemed reasonable to eliminate any projects which could not achieve at least a 10% return.

Three investments were under consideration:

- The purchase of an electric typewriter to improve the quantity and quality of typed work produced by the office.
- The purchase of a new pick-up to deliver farm inputs to members' farms.
- The installation of a new security fence to reduce pilferage from the society's warehouse.

The economics of these investments were expected to be as follows:

Typewriter

- Cost $1,000.
- Annual benefits net of servicing costs $300.
- Life oftypewriter five years.
- Sale value at end of five years $100.

Pick-up

- Cost $8,000.
- Annual savings through reduced use of private contractors $2,000 net of driver's wages and operating costs.
- Life of vehicle four years.
- Sale value of vehicle at the end of four years $2,000.

Security Fence

- Cost $2,000.
- Estimated saving in reduced pilferage $230 per year.
- Life of fence 20 years.
- Sale value at end of 20 years nil, complete replacement required.

Assignment:

Which of the three projects passes the test of achieving an annual rate of return in excess of 10%?

b) Three far more ambitious projects were suggested, but for these the management decided that they must attempt to find out the actual rate of return on the investments involved. In this way the projects could be compared with one another and with possible sources of funds which might be available for particular types of investment. The data on the projects were as follows:

- A Tractor Hire Service

  The society would buy three tractors for a total of $60,000, and would hire these out to members for ploughing or other work. The annual fixed costs of operation, including the drivers' wages, maintenance and repairs were estimated to be $5,000 per tractor. Each tractor would cost a further $10 per hour to operate. The management estimated that members would utilise 1,500 hours in the first year of operation. This would be expected to increase to 3,000 hours in the second year and 4,500 hours in the third and subsequent years. Members would be charged $20 per hour for the use of a tractor. The economic life of the tractors was said to be approximately eight years, but they could at the end of this period be sold for approximately $5,000 each.

- A Service Station

A service station for selling petrol and vehicle maintenance services to members and non-members was proposed. The cost of the site and construction of the necessary facilities would be $100,000. The station would be expected to lose $5,000 during its first year, to break even in the second year, to earn a net surplus of $10,000 in the third year and $30,000 per year thereafter. It would be necessary to finance stocks of fuel and spares and the working capital required for this was estimated to be $10,000 initially. A further $10,000 would have to be invested during the third year to finance the increased business. The complete petrol station would require reconstruction after about ten years, because of the age of the equipment and probable new regulations. It was also possible that a new ring road would be constructed round the town after about ten years. Then with the loss of traffic, the petrol station would cease to be viable.

- Hotel and Restaurant

An existing business could be bought for $100,000. For tax reasons the owner wished to receive half the purchase price on conclusion of the deal, with the other half paid in five equal annual instalments thereafter. 'The hotel was currently earning an annual profit of $20,000, but this would probably drop by half in the first year of operation by new owners. They could not hope to have all the personal contacts enjoyed by the previous owner. However, from the second year on it was forecast that the project would again reach about $20,000.

Assignment :

What rate of return does each of these three projects earn?

SESSION 4.8

WHAT IF IT GOES WRONG? - SENSITIVITY ANALYSIS

Objective: To enable trainees to identify (i) those factors whose actual values may be different from estimates, and (ii) to assess the effect these might have on projects.

Time: 2 to 3 hours.

Material: Exercises from Session 4.7.

Session Guide:

1) Ask trainees what sort of questions banks are likely to ask them when they are requesting to fund co-operative projects. Write the following examples of answers on the chalkboard/OHP:

- A new processing factory will cost "A" to buy and install.
- The factory will cost "B" to operate and maintain every year.
- The factory will process "C" tons per year, of a crop produced by members.
- The factory will pay members "D" per ton for produce delivered to the factory.
- The factory will sell the produce for "E" per ton to customers.

A perceptive and critical analyst will ask three types of questions (write these on the chalkboard/OHP):

- How likely is it that the figures "A", "B", "C", "D" and "E" will be the same as forecast?
- What range of values are possible for "A", "B", "C", D"

What will happen if the forecast is inaccurate, or if the values are close to the least satisfactory of the possible ranges in each case?

2) Ask trainees to suggest which of the variables represented by "A", "C", "D" and "E" is:

- most likely to vary from the forecast;
- most likely to have a serious effect on the project's viability if it does vary.

The answer depends on the nature of the commodity and the project involved, but any analyst must accept that the forecasts may be incorrect. Therefore:

- He must estimate the likely range within which each important variable is likely to fall.
- He must calculate the effect of the worst likely combination of misfortunes on the viability of the project.

3) Refer trainees to the exercise in Session 4.7. Ask them to identify the critical variables.

- Cost of tractors.
- Cost of tractors' operation.
- Hours of tractor time to be used by members.
- Fees to be paid by members.
- Life of tractors.
- Salvage value of tractors.

Ask trainees to suggest the highest and lowest reasonable values for each of these. Remind them to ignore the effect of inflation.

Replies will depend on trainees' own judgement and experience, but here are some suggested answers:

<u>Cost of Tractors</u>

$60,000 to $65,000 for three tractors. Higher price possible because of (i) necessary extras not yet identified, (ii) delivery and licencing charges, (iii) increase in price after the quotation and before the placing of the order.

Cost of Tractor Operation

Fixed Costs = $4,000 to $6,000 per year per tractor.
Variable Costs = $9 to $13 per hour.

Wages, frequency and cost of routine maintenance, life of major replacement parts may vary. Fuel prices may rise above the general level of inflation.

Hours of Tractor Time to be Used

Minimum number of hours: forecast less one third.
Maximum number of hours: 4,500 per year from the very beginning. This variation is possible since it is very difficult to asses the response to a service which is not yet available. The upper limit is fixed by capacity.

Fee Charged to Members

$15 to $25 per hour. The lower figure might be applied if an unexpectedly low demand required stimulation. The higher figure might be imposed if fuel costs increased excessively.

Life of Tractors

Three to ten years. The lower figure might apply as a result of poor maintenance.

Salvage Value of Tractors

$1,000 to $10,000 for each tractor. Lower value might be the result of misuse. Higher value possible if import restrictions are imposed.

4) Ask trainees how they can assess the effect of the worst set of circumstances on the economics of the project. Display on the chalkboard/OHP the data calculated in 4.7, showing the 29% rate of return. What modification should be made to the figures to reflect the most pessimistic view of the project? This is the aspect a banker or other source of funding must take into account.

- Is it justifiable to use the "worst" value for each variable?
- Is there a chance that higher than expected operation costs will be associated with low fees?

- Is low hour utilisation likely to be associated with short life and high operating costs?

- Is it possible that low utilisation will be associated with a low salvage value?

Clearly these and other combinations are possible but very unlikely. Anything <u>can</u> go wrong, but bankers and managers should confine their attention to things that a reasonable person might expect to go wrong.

5) Ask trainees to suggest a worst likely set of values for the figures for the tractor hire service. Possibilities include:

Item	Possibility A	Possibility B	Possibility C
Cost of Tractors	$65,000	$65,000	$65,000
Fixed Costs of Operations	$18,000	$15,000	$15,000
Variable Costs of Operation per Hour	$ 13	$ 10	$ 13
Time Used Year 1 Year 2 Year 3 to 5	 1,000 hours 2,000 hours 3,000 hours	 1,000 hours 2,000 hours 3,000 hours	 1,500 hours 3,000 hours 4,500 hours
Hire Charge	$ 25	$ 15	$ 20
Life of Tractor	5 years	5 years	3 years
Salvage Value	$ 6,000	$ 6,000	$ 3,000

Ask trainees to calculate the effect on the rate of return of these apparently least profitable sets of changes, using the discount table if necessay.

Calculations for situations A, B, and C are as follows:

(Note: these suggestions and calculations should not necessarily be used; trainees should be encouraged to develop and work out the implications of their own worst likely estimates.)

Possibility A

Years	Dollars Out	Dollars In
0	$65,000	
1	$ 6,000	
2		$ 6,000
3 to 5		$18,000
End of 5		$ 6,000
Total	$71,000	$66,000

Thus the net outflow is minus $5,000. Since the value without applying discount factors is negative, the project will not pay for itself and is therefore not worthwhile.

Possibility B

Years	Dollars Out	Dollars In
0	$65,000	
1	$10,000	
2	$ 5,000	
3 to 5		
End of 5		$6,000
Total	$80,000	$6,000

Under these circumstances the project is even more unprofitable. This conclusion can be reached without using discount tables.

Possibility C

Years	Dollars Out	Dollars In
0	$65,000	
1	$ 4,500	
2		$ 6,000
3		$16,500
End of 3		$ 3,000
Total	$69,500	$25,500

Net outflow undiscounted is $44,000. The project is not worthwhile under these circumstances either.

6) Ask trainees what conclusions they draw from this recalculation. The projected tractor hire service originally showed high profitable results.

- The economics of the project appear more susceptible to short tractor life than to underutilisation.
- Management should concentrate on careful maintenance and use, so as to prolong the life of the tractors. Extra use should not be encouraged if overutilisation or inadequate maintenance would result.
- If there is a good chance that the level of the actual results will be that suggested by the pessimistic figures, the project should be reconsidered. This is particularly necessary if it must pay for itself. A banker, or other source of funds, would be most reluctant to support a project on a self-financing basis if figures of this type were at all likely.

7) Ask trainees to suggest similar sets of figures for the pick-up project described in Session 4.7. What are their likely pessimistic sets of estimates?

Item	Situation A	Situation B
Cost of Vehicle	$8,000 (no change)	$8,000 (no change)
Annual Savings	$1,000	$2,000
Life of Vehicle	4 Years	3 years
Salvage Value of Vehicle	$2,000	$2,000

Ask trainees to make the necessary calculations.

Time	Situation A		Situation B	
	Dollars Out	Dollars In	Dollars Out	Dollars In
Year 0	$8,000		$8,000	
Total Savings During Life of Project		$4,000		$6,000
Salvage Value at End of Project		$2,000		$2,000
Total Value	$8,000	$6,000	$8,000	$8,000

Both possibilities will show a negative present value if the future items are discounted, since Situation A is negative without discounting, and Situation B breaks even. The effect of lower use and savings is worse than higher use with reduced vehicle life. Higher than estimated use would probably be favourable, even if this was associated with reduced vehicle life.

This implies that, in this case, the vehicle must be fully used. Management must ensure that the estimated savings can be achieved, even at the expense of greater than expected vehicle usage.

8) Ask trainees to attempt <u>to identify critical factors</u> in other projects included in the exercises in Session 4.7.

- Typewriter . . . Annual benefits.
- Security Fence . . . Estimated savings from reduced pilferage.
- Service Station . . .Estimated life of service station site.

- Hotel and Restaurant . . . Time to return to existing profitability.

If time allows, ask trainees to suggest "worst likely" values for each of these items, and to calculate the effect of these values on the viability of the respective projects.

Reasonable estimates might be as follows:

- Typewriter . . . Annual benefits reduced to $100 per year.
- Security Fence . . . Annual savings from pilferage reduced to nil.
- Service Station . . . Life of site reduced to seven years.
- Hotel and Restaurant . . . Delay in return to profitability increased to two years.

It is clear without further calculation that the first two examples will not "pay for themselves" with future benefits not discounted at all. Ask trainees whether this means that the investment should not be made.

Clearly the conclusion depends on the reliability of the estmate. If the pessimistic figures suggested above are almost as likely to be the eventual outcome as the original estimates, the project should not be undertaken.

The figure for the "Service Station" clearly illustrates a marginal repayment of investment without discounting:

- Profit in 7 years of life, 4 x $30,000	=	$120,000
- Investment, $100,000 + $10,000 + $5,000	=	$115,000
- Total Surplus	=	$ 5,000

Trainees should by this stage appreciate that this marginal surplus implies a very low rate of return. The actual figure is under 1% as can be shown by calculation.

The "Hotel and Restaurant" project would not be so seriously affected by one year's delay.

9) Ask trainees why a banker may be particularly concerned to know the final effect of "worst likely" values for critical variables. Is a banker principally concerned with the rate of return of the project on its own, or with something else?

Bankers are concerned mainly with the security of money they have lent. If pessimistic but reasonably likely values lead to inability to repay, banks may demand further security or reconsideration of the project.

Thus bankers are likely to demand "sensitivity analyses" or calculation of the effects of variation from estimates, especially if:

- the project is so large in relation to the organisation that its failure to generate funds for repaying a loan cannot be covered by funds from other activities;
- the whole organisation is a new one, devoted wholly to the project for which funding is requested;
- the project is sponsored, but not guaranteed, by another organisation, so that legally it must generate its own funds for repayment of loans.

Ask trainees which of the six projects presented in Session 4.7 might possibly fall into one of these categories:

- the service station
- the hotel and restaurant.

Any society and its management should always be interested in the effect of an unfavourable outcome of a project, particularly if the project is large in relation to the whole society, for if the project does fail, what effect will this have on the society as a whole?

SESSION 4.9

APPRAISAL RISK

Objective: To enable trainees (i) to apply their ability to assess risk, (ii) to identify critical variables and (iii) to calculate rates of return to a rather complex project.

Time: 2 hours.

Material: "The Grain Storage System" (case study session 4.5) together with whatever statement of cash flows was finally agreed by trainees. See back of Sheet 2 of this session for an example. If possible, such a table should be reproduced to provide each trainee with a copy.

Session Guide:

1) Remind trainees of "The Grain Storage System" exercise used in Session 4.5. Ensure that every trainee has a copy of the original case study and, if possible, of an agreed schedule of costs and benefits.

Ask trainees how the techniques used in Sessions 4.5 to 4.7 can be used in making a choice between the two systems.

Trainees have been introduced to two ways of using the discount tables. They can use the tables:

a) to decide whether a project's present value is positive or negative at a given rate of return;

b) to discover the rate of return for a project.

Method a) is used to decide whether projects pass the test of achieving a certain rate of return. Ask trainees when this approach might be used:

- when investment funds are available at a certain rate of interest, all projects over that rate can be financed and implemented;

- when the society has a minimum rate of return to be achieved by all activities, at demand of those who invest their own money in it.

Method b) can be used to rank projects in order of the rate of return. When might this be used?

- when a society has limited funds and can only afford to implement a small proportion of the projects which are available;
- when management capacity to investigate and implement projects is limited, a preliminary screening can be carried out to determine an order of priority.

2) Ask trainees to identify AFS management's objectives in the grain handling system project, whichever system is chosen. Suggestions may be as follows:

- to minimise losses;
- to yield a satisfactory rate of return, which will benefit members and society in general.

Losses could be reduced to zero, but at enormous cost. The objec-. tive therefore is to make a satisfactory return on the society's investment and not merely to minimise losses.

Ask trainees to identify the alternatives open to the society. Most will refer to the two systems described in the case study. Elicit or, if necessary, remind trainees that there is a third alternative, namely to continue with the present method. One of the new systems should be chosen only if it yields a satisfactory return.

Ensure that trainees appreciate that the grain storage case is not a matter of ranking a number of alternatives, any of which could be implemented, but of selecting one from three options. It is therefore appropriate to use method b) in order to find out which has the highest rate of return.

3) Divide trainees into groups and allow them up to 45 minutes to discount the cash flows in the schedule.

Depending on the numbers in the groups, the time available and their interest in "shadow pricing", groups may be asked to calculate the rates of return either for both the adjusted and the unadjusted figures, or only for one set of figures.

Before they start work, ask trainees whether they should continue the figures beyond year ten in the schedule. By this stage they should appreciate that:

- discount rates for figures ten years or more into the future are unlikely to affect the outcome, unless the amounts are very large;
- timing of the replacement of the mechanised system means that it is probably necessary to add a further five years to include income flows up till year 15.

4) Allow trainees up to 40 minutes to complete their calculations. If trainees find it difficult to identify a "first try" discount rate, advise them accordingly.

- Example

Concrete bins, unadjusted figures

Total period	15 years
Total investment during these 15 years	$ 25,000
Total revenue during these 15 years	$ 77,000

Average (non discounted) annual return

$$\frac{77,000}{25,000} \times \frac{100}{15} = 20.53\%$$

First try could be 20.

Reconvene the group and ask groups to give their figures for each option, using unadjusted or adjusted figures as requested. The following figures show one way in which the rates of return for each alternative can be estimated.

Concrete Bins, Unadjusted Figures

Time	Net Cash Flow	20% Factor	Result	24% Factor	Result	26% Factor	Result
0	($ 1,000)		($ 1,000)		($ 1,000)		($ 1,000)
During Year 1	($15,000)	0.833	($12,495)	0.806	($12,090)	0.794	($11,910)
End Year 1	($ 3,000)	0.833	($ 2,499)	0.806	($ 2,418)	0.794	($ 2,382)
Years 2 to 15	$ 5,500	3.842	$21,131	3.195	$17,572	2.932	$16,126
End Year 6	($ 3,000)	0.335	($ 1,005)	0.275	($ 825)	0.250	($ 750)
End Year 11	($ 3,000)	0.135	($ 405)	0.094	($ 282)	0.079	($ 237)
Net Total			+$ 3,727		+$ 957		-$ 153

The rate of return for the concrete bin system, using unadjusted figures, is slightly under 26%.

Concrete Bins, Adjusted Figures

Time	Net Cash Flow	30% Factor	Result	35% Factor	Result
0	Nil				
Year 1	($15,000)	0.769	($11,535)	0.741	($11,115)
End Year 1	($ 6,000)	0.769	($ 4,614)	0.741	($ 4,446)
Years 2 to 15	$ 7,500	2.499	$18,742	2.084	$15,630
End Year 6	($ 6,000)	0.207	($1,242)	0.165	($ 990)
End Year 11	($ 6,000)	0.056	($ 336)	0.037	($ 222)
Net Total			+$ 1,015		-$ 1,143

The rate of return for the concrete bin system using adjusted figures is thus approximately 32%.

Explain to trainees how it is possible to interpolate between the discount rates given in the table.

Example: use the adjusted figures for the concrete bins proposed.

- A 30% discount rate is too low as it results in a net total of +$1,015.
- A 35% discount rate is too high as it results in a net total of -$1,143.

In other words, a 5% (35% - 30%) difference in discount rate results in $2,158 ($1,015 + $1,143) difference in discounted cash flow.

5% $2,158

1% $2,158 / 5 = $432

From this it is easy to conclude that a 32% discount rate will bring the discounted net total down to +$151 (+$1,015 - $864).

The rate of return for the project is therefore slightly over 32%.

It is not necessary to produce more accurate figures since the calculations depend on gross estimates which are themselves subject to wide margins of error. Any more acccurate calculations can give a wholly misleading impression of accuracy.

Mechanised System, Unadjusted Figures

Time	Net Flow	50% Factor	Result
0	($20,000)		($20,000)
Years 1 to 15	$12,100	1.995	$24,139
End Year 10	($20,000)	0.017	($ 340)
Net Total			+$ 3,799

The rate of return for the mechanised system using unadjusted figures is thus over 50%.

Point out to trainees that the tables do not 'include figures for returns over 50%, since any project with a rate approaching that level is clearly worthwhile. Management factors, and the reliability of estimates, are far more valid standards of comparison for projects at this extremely high rate of return.

Mechanised System, Adjusted Figures

Time	Net Cash Flow	25% Factor	Result	26% Factor	Result	28% Factor	Result
0	($40,000)		($40,000)		($40,000)		($40,000)
Years 1 to 15	$12,300	3.859	$47,466	3.726	$45,830	3.483	$42,841
End Year 10	($40,000)	0.107	($ 4,280)	0.099	($ 3,960)	0.085	($ 3,400)
Net Total			+$ 3,186		+$ 1,870		-$ 559

The rate of return for the mechanised system using adjusted figures is thus approximately 27%.

Explain to trainees how the "first try" figure of 25% was selected and the process of trial and error by which the actual approximation is reached.

The complete set of answers may now be given as follows:

	Concrete Bins	Mechanised System
Adjusted Figures	32%	27%
Unadjusted Figures	26%	over 50%

5) Trainees may become so involved in the calculations that they forget the purpose of the exercise - to select the best method of storing food grain.

Ask trainees which system they would recommend:

- using unadjusted figures: the mechanised system;

- using adjusted figures : the concrete bin system.

This example illustrates how the use of "shadow prices" can influence selection of projects which employ more people and use less foreign exchange. Stress that the sequence of project analysis and comparison must be as follows:

a) Identify projects available.

b) Identify costs and benefits associated with each.

c) Adjust costs and benefits to take account of socio-economic factors (if appropriate).

d) Calculate rates of return of each project in real as well as shadow prices.

e) Select the best project (important: if selection is based on "shadow prices", ensure that real return is high enough to repay investment, to pay a surplus, and so on; actual results will depend solely on real prices!).

6) Refer to the previous session and ask trainees to identify the single most critical variable, which is also the most difficult to estimate.

Clearly this is the amount by which the losses will be reduced in each system.

Ask trainees to suggest which system would be most sensitive to lower-than-anticipated loss reductions. The return from the mechanised system, which has the largest investment, will clearly be more seriously affected by a lower rate of loss reduction or savings.

Demonstrate this by asking trainees to recalculate the returns for both projects, assuming halved estimates of savings in each case and using the adjusted figures. Calculations should be as follows:

Concrete Bins.

Time	Cash Flow	1% Discount Factor	Result
Year 1	($15,000)	0.990	($14,850)
End Year 1	($ 6,000)	0.990	($ 5,940)
Years 2 to 15	$ 2,500	12.875	$32,187
End Year 6	($ 6,000)	0.942	($ 5,652)
End Year 11	($ 6,000)	0.896	($ 5,376)
Net Total			+$ 369

The return is a little more than 1%, using the adjusted figures.

Mechanised System

Time	Cash Flow
Year 0	($40,000)
Years 1 to 15	$ 4,300
End Year 10	($40,000)

The cash flow undiscounted is $64,500 - $80,000 = -$15,500.

The project is therefore not viable if the expected savings are halved.

Tell trainees that after a technical review of both systems halved estimates of savings for each project prove to be much more realistic than original estimates. Would trainees' above calculations lead them to implement the concrete bins project? If so, what will be the actual results of the concrete bins project? Remind trainees that a project may be selected because of shadow prices, but that the actual results will depend on real (i.e. unadjusted) figures only.

Elicit that it is necessary to calculate the actual return based on unadjusted figures for both the concrete bins and the mechanised system, assuming halved estimates of savings.

Calculations will be as follows:

Concrete Bins:

Time	Cash Flow
Year 0	($ 1,000)
Year 1	($15,000)
End Year 1	($ 3,000)
Years 2 to 15	$ 500
End Year 6	($ 3,000)
End Year 11	($ 3,000)

The bin system gives an undiscounted loss of $18,000.

Mechanised System:

Time	Cash Flow	12% Discount Factor	Result	14% Discount Factor	Result
Year 0	($20,000)	-	($20,000)	-	($20,000)
Year 1 - 15	$ 4,100	6.811	$27,925	6.142	$25,182
End Year 10	($20,000)	0.322	($ 6,440)	0.270	($ 5,400)
Net Total			+$ 1,485		-$ 218

The mechanised system will still give a <u>real</u> rate of return of about 14%.

In other words with half the original savings, the concrete bin system will lead to a financial loss when implemented, and this despite its beneficial social effects. It can only be implemented if somebody is prepared to make up for the financial losses i.e to subsidise the project. The mechanised system however, will still yield a 14% financial return and can therefore be implemented, despite the fact that from a social point of view it is not as beneficial as the concrete bins.

topic

5

risk and other variables - final presentation

Session 5.1 Dealing with Risk - Probability

Session 5.2 Risk Exercises

Session 5.3 Member Viability

Session 5.4 Human Factors

Session 5.5 Project Presentation

SESSION 5.1

DEALING WITH RISK - PROBABILITY

Objective: To enable trainees to recommend appropriate investments to avoid risk by comparing objective assessment of risk with the cost of avoiding it.

Time: 1 to 2 hours.

Material: Exercises: "Is It Worth It?"

Session Guide:

1) Ask trainees to give examples of risks which they, or their societies are insured against. Depending on local circumstances, these might be:

- drivers' third party insurance;
- insurance of houses or other property against fire or theft.

Ask those who have such insurances how often they have had to claim, or how likely it is that they will have to make a claim in the future. Most of the accidents against which people carry insurance are very rare. Why do they spend money on insurance?

- Because the financial loss occasioned if the accident (fire, car crash, theft, etc.) occurred is so great that the person is unwilling to risk suffering it.
- Because the person thinks the cost of insurance is worth paying as protection against loss.

2) Ask trainees who own a car or often travel by car whether they carry a spare tyre. A spare tyre costs money and occupies valuable space. Why do they carry one?

Because they believe it is worth paying the cost of carrying a spare tyre to avoid the cost of being unable to change the wheel if they have a puncture.

- The cost of the "risk" is seen as being greater than the cost of the "insurance"

Ask trainees whether they ever carry two spare tyres. The extra cost and space would be the same as for the one tyre, or perhaps rather less. Why do they not carry a second spare?

Because they believe that it is not worth paying the cost of a second tyre since it is very unlikely that they will have two punctures in one journey.

- The cost of "insurance" is perceived to be greater than the cost of the "risk"

3) Willingness to pay for protection against risk is therefore made up of three factors:

- The cost of protection.
- The cost of the accident if it does occur.
- The likelihood of the accident occurring.

4) Ask trainees to suggest examples of risks which a co-operative society runs in the normal course of its business and which it can be insured against.

- The risk of losing vehicles by theft or accident.
- The risk of claim by third parties when one of the society's vehicles is involved in an accident resulting in injury to employees or other people. Those injured are known as "third parties".

These losses can be insured against. In some cases insurance is a legal requirement. In most cases co-operatives, as well as individuals and other organisations, believe that the cost of insurance is worth paying to avoid the penalty of the accident.

5) Ask trainees to give examples of other types of losses which co-operative societies may suffer, and against which it is not usual, or possible, to buy insurance.

- Processed crop prices may drop unexpectedly.
- Processing equipment or farm machinery may break down unexpectedly while being used.
- Essential farm inputs may unexpectedly rise in price, or cease to be available at all.
- Staff may cheat the society.

Ask trainees how a co-operative society can "insure" against this type of loss, or at least reduce the risk, without buying an actual insurance.

- By selling crops early, preferring an acceptable price today to the risk of a lower, (or perhaps a higher) price at a future date.
- By overhauling or replacing equipment before it breaks down.
- By purchasing supplies or farm inputs when they are available, and incurring storage and financing charges in order to avoid the risk of non-availability, or higher prices, later.
- By having complicated procedures and double checks, the possibility of loss by staff dishonesty is reduced at the cost of extra work and delay.

6) Ask trainees how they decide whether or not to make "insurance" investments of this sort.

- Estimate the cost of the protection.
- Estimate (i) the cost of accident and (ii) how much the cost would be reduced if protection was purchased.
- Estimate the likelihood of the accident occurring.

Ask trainees to state which of these three is the most difficult to estimate. Clearly the likelihood of an accident is impossible to forecast accurately; in fact it is difficult to estimate at all. What techniques are there for estimating "risk" or "possibilities"?

7) Ask trainees to write down on a piece of paper how much money they will pay for an undertaking by yourself that you will give them $1 if a coin comes up heads when it is tossed once.

Trainees' "bets" will differ, but none should be over 50 cents. Ask trainees why this is so. They know that the "odds" or probability of the coin coming up heads is only one in two, or 50%, and therefore they are not willing to bet more than half of the possible reward.

Explain the construction of a roulette board, where a ball has an equal chance of falling in any one of twenty holes. Ask trainees to decide which of the following bets they would be willing to make.

a) Bet $5 to win $40 if the ball lands in any one of the two nominated holes.

b) Bet $10 to win $20 if the ball lands in any one of the five nominated holes.

c) Bet $1 to win $25 if the ball lands in one nominated hole.

d) Bet $5 to win $7.50 if the ball lands in any one of ten nomi-. nated holes.

In each case it is necessary:

- To calculate the odds or likelihood of success.
- To relate the odds to the relationship between the investment and the return.

The analysis of these examples is as follows:

a) The odds being 2 to 20 means that the one who bets will on average have to play at least ten times to be sure to win once. Betting $5 ten times will amount to a $50 investment. The return of such an investment, however, will only be $40 (the prize). Hence the bet is not worthwhile. Mathematically this can be calculated as follows:

Odds are 2/20 or 10%.

Investment is

Hence the bet is not worthwhile.

b) The odds being 5 to 20 means that the one who bets will have to play at least four times to be sure to win once. Betting $10 four times will cost him $40. His return will however only be $20. Hence the bet is not worthwhile. Mathematically this can be calculated as follows:

Odds are 5/20 or 25%.

Investment is 10/20 or 50% of the return.

Hence the bet is not worthwhile.

The same reasoning applies to bets c) and d).

c) c) Odds are 1/20 or 5%.

Investment is 1/25 or 4% of the return.

Hence the bet is worthwhile.

d) d) Odds are 10/20 or 50%.

Investment is 7/7.5 or 66% of the return.

Hence the bet is not worthwhile.

8) Distribute the exercise sheet and ask trainees to apply a similar approach to the co-operative investment decisions described.

Allow up to half an hour for this and circulate among trainees to ensure that all grasp the principles involved.

9) Reconvene the group and ask them to state and explain their recommendations. The straightforward mathematical calculations

should be given and explained before any further analysis or discussion is permitted. The calculations are as follows:

a) The odds of rain are $\frac{1}{10}$ or 10%.

The cost of protection is $\frac{1}{15}$ or 6.6% of the cost of damage.

It is worth renting covered storage.

b) The odds of breakdown are $\frac{1}{50}$ or 2%.

The cost of protection is $\frac{3,000}{100,000}$ or 3% of the cost of breakdown.

It is not worth having new bearings installed.

c) The odds of non-availability are $\frac{1}{4}$ or25%.

The cost of protection is $\frac{500}{5,000}$ or 10% of the cost of non availability.

It is worth buying in advance.

d) The odds of rain are $\frac{1}{15}$ or 6.6%.

The cost of protection is $\frac{1}{15}$ or 6.6% of the cost of damage

There is no advantage in either solution.

10) Ask trainees to suggest reasons why the simple mathematical calculations may not necessarily give the complete answer.

- "Members' confidence" or "customer goodwill" may be lost as well as a crop harvest. These types of loss are impossible to quantify, but may increase the value of protection.

- A particular financial loss may be so serious as to undermine or destroy the society altogether. The loss would thus be far greater than the single financial amount needed to buy protec tion. In other words, protection would be proportionally more valuable.

Stress that while facts of this sort must be considered, and may over-rule simple mathematical conclusions, they should not be allowed to replace the objective calculations altogether.

Mathematical techniques of this sort allow the manager to concentrate his attention on the areas where judgement is necessary. The calculated decision may be reversed, but the need for reversal must be clear and justifiable.

Is It Worth It?: Exercises

a) Weather records show that in one year in ten rain falls during the normally dry season. Harvested crops stored in the open are ruined that year. The co-operative society is offered the use of a covered store for the dry season, for an annual rent of $1,000 instead of storing in the open. If rain does ruin the crop, the society suffers a loss of $15,000. Should they rent the store or continue to store in the open?

b) An expert mechanic reckons that the bearings in a society's processing machinery should last another season, but he says there is a one in fifty chance they will break down. If they do, processing will not be completed and the society will lose about $100,000. It will cost the society $3,000 to renew the bearings for the year. The complete plant is to be replaced next year in any case. Should they renew the bearings?

c) A society can buy fertilizer as it is needed, for direct delivery to members, or can buy it in advance. Advance purchase means storage, double handling and further delivery which costs the society about $500 more. In approximately one year in four, however, fertilizer is unavailable at the time the farmers want to use it. If the society cannot provide fertilizer, they will lose about $5,000. Should they buy in advance or not?

d) The same as a), but the odds that rain falls during the normally dry season are one year in fifteen.

SESSION 5.2

RISK EXERCISES

Objective: To enable trainees (i) to assess the degree of risk in various projects and (ii) to make appropriate allowances to cover or reduce such risks when appraising projects.

Time: 1 to 2 hours.

Material: Tape Dialogue.

Session Guide:

1) Remind trainees of the exercises and examples used in the previous session. How realistic were they?

Managers rarely have:

- a quantitative statement of the "odds" of misfortune;
- a definite figure for the cost of such misfortune if it does occur;
- possible investments which will totally remove (as opposed to merely reduce) the risk of loss.

2) Management must still however take account of risks. Ask trainees which of the following two investments they would prefer to make:

a) Deposit $100 in a bank to earn a guaranteed $10 interest per year.

b) Lend $100 to an acquaintance who plans to start a business; he will pay you $10 a year interest.

Clearly a) is a better investment since:

- the investment is the same;
- the return is the same;
- the risk is far lower.

Any manager responsible for selecting investments must make some assessment of the risks. His conclusions may not be expressed in "odds", as in the previous session, but his decision will demonstrate his view as to the degree of risk involved.

3) Play or enact the tape dialogue. Ask trainees to listen carefully and to decide which side they support.

If necessary play the dialogue a second time. Take a "vote" to measure support for the two opposing views.

Ask trainees to comment on the apparent decision making methods of the committee in the dialogue. What is missing from their deliberations?

- Clear statements of the costs and benefits of alternative investments.
- An assessment of the chances that all may not go according to plan.
- Reasonable estimates of the actual costs of failure and rewards of success.
- Assessment of the effects of failure on the co-operative as a whole.
- A balanced, quantitative and dispassionate appraisal.

Quantitative decision making techniques <u>cannot</u> remove the need for judgement. "Quantifying" certain aspects of the decision making process can however expose the areas where judgement is most needed.

4) Select a future possibility with which trainees are familiar which may or may not occur in about twelve months.

Examples:

- a particular political party will win the next election;
- the rate of exchange between one currency and another will pass a certain point;
- the price of a certain commodity will reach a certain level.

Trainees should imagine that they have $100 to invest. They have two alternatives:

- they deposit it in the bank and get back the principal with an additional $10;
- they invest it in a somewhat risky event and get back the principal with $x if the chosen event takes place.

Ask trainees to write down their minimum value for x.

5) After trainess have individually written down their "bids", ask them to read them out. List them on the chalkboard/OHP, from highest to lowest.

The range of bids will clearly depend on trainees' perception of the likelihood of the event occurring. No trainee should have bid lower than $10, since the uncertain event is less likely than the certainty of interest on the bank deposit.

Explain that trainees' bids represent their perception of the risk (or odds) of the uncertain event taking place.

- A bid of $50 assumes that the, event is five times less likely than the certain event of $10 bank interest being received. Anybody who bid $50 believes that there is one in five chance of the unlikely event occurring.
- A bid of $15 is one and a half times the $10 certain return. Whoever makes such a bid believes that there is one in one and a half chance, or two chances out of three that the event will occur.

6) Ask trainees how they can compare the returns of the following two alternative investments?

- $100 bank deposit to earn $10 a year.
- $100 deposit to earn $50 only if a given uncertain event occurs. The analyst thus believes that the chances of the event occurring are one in five.

Ask trainees to calculate the average profit on the second investment if it was made five times.

The calculation is as follows:

	Return
First unsuccessful attempt	$ 0
Second unsuccessful attempt	0
Third unsuccessful attempt	0
Fourth unsuccessful attempt	0
Fifth successful attempt	50
Total	$ 50
Average of 5 attempts $\frac{50}{5}$	$ 10

Returns on risky investments can be made comparable with those on secure ones by dividing the higher but less likely returns by the odds against its occurring. In the above example, both investments are equally good.

The chances or odds cannot usually be accurately assessed. They can however be estimated by a process such as the one which has been carried out above. If a number of well-informed people participate in such a process, the average of their views will represent an informed opinion about the risk or odds. Such a risk figure can then be used to reduce the rate of return of risky ventures in order to make them comparable with more secure, but apparently less profitable alternatives.

7) Two people may agree on the odds of a certain event occurring, such as a horse winning a race or a commodity price rise. However, one will bet while another will refuse to make a bet. Why is this?

Some people like to take risks, while others prefer security. This is a natural difference in personality. Neither view is right or wrong.

Why should managers behave any differently when making investment decisions for their co-operative? Is it not more a matter of temperament than attempts to quantify risks such as have been covered in this and the previous session?

Co-operative managers are dealing with members' money and not their own. Management should be rational and not depend on temperament. This does not mean that co-operative managers should not take risks. Enterprise development and growth depends on risk taking, but risks should be taken on the basis of:

- an attempt to estimate the chances of the unfavourable outcome, as suggested above;
- investigation of the likely cost of an unfavourable outcome;
- investigation and quantitative assessment of (i) the costs and benefits of every possible means of reducing the chance of misfortune, (ii) the cost if the misfortune does occur;
- assessment of the effect of the worst likely set of circumstances on the co-operative as a whole and on individual members.

Tape Dialogue

Narrator: It was late and the committee meeting of the Agrarian Farmers' Society had already spent many hours considering a lot of simple issues. The final item on the agenda was the sale of the remaining stock of processed grain. The chairman thought this would be a formality, as it had been in the previous seasons.

Chairman: Finally, fellow co-operators, may I come to the last item on the agenda. It is proposed, as in previous years, to sell all the remaining stock of grain. This has been a good season. We can clear the stores next week and then we'll have six months before the new crop starts to come in. Secretary, could you give us the details?

Secretary: Yes, Mr. Chairman. We have 80 tons, and at today's price of $125 a ton, this should give us $10,000. The bank will be pleased to see the money in our account, I can assure you.

Chairman: Thank you. Co-operators, may I have a proposal that the grain be sold as soon as possible. Ah, Peter, are you proposing this?

Peter: Yes, Chairman, with pleasure.

Chairman: What about a seconder, ah, Paul is that you?

Paul: Yes, of course I'll second the proposal.

Chairman: Now, are we all in favour? Oh, James, what have you got to say?

James: Well, Mr. Chairman, I'd like to suggest an alternative, if I may.

Chairman: Well, we've always sold at this time in the past, but let's hear what you have to say.

James: May I ask the secretary, through you Mr. Chairman, what we will be doing with the $10,000 when we get it.

Secretary: Yes, of course, we'll be putting it in the bank.

James: And what good will it do us there?

Secretary: Well, money in the bank does no harm, I believe. We are overdrawn now by $5,000. This is costing us about $50 a month, so there'll be that saving right away.

James: What other benefit will there be?

Chairman: Excuse me, but is all this necessary?

John: Oh, it sounds worth pursuing to me, I must say.

Chairman: All right, go on James.

Secretary: As I said, the bank manager will be very happy to see a positive balance for once. I'm sure he's been a good friend to us.

James: Of course he is, after all we're proposing to lend him $5,000 interest free. What about putting it on deposit?

Secretary: I suppose we could do that. It will earn us about $300 in the six months before we start to pay out again.

Chairman: I must admit, fellow co-operators, this sounds reasonable. Should I take it as a proposal that the funds should be put on deposit, after clearing the overdraft of course?

James: Please, Mr. Chairman, I'd like to add to what I've already said. What is going to happen to the price of grain in the next six months.

Chairman: Well, it always goes up as stocks go down, but that's the trader's business, not ours.

James: It always has been, I agree, but should it always be? May I ask again, what will the price of grain be six months from now?

Peter: Maybe I could come in, Mr. Chairman. I don't know, none of us knows. It may be higher than $125 - it may be the same - it might even be lower. What difference does it make anyway?

James: I suggest that we should use our storage space and hold on to the grain until the price goes higher. Some time during the next six months it will surely be more than $125. Remember, our members depend on us to get the best price for their produce! What right have we to sell it off now, just because it's administratively convenient?

Peter: I'm sorry, but I cannot agree. Who knows what the price will do? We're not speculators, we're the trustees of our members' produce. We must not abuse their confidence.

Chairman: Now, fellow co-operators, let's not be unpleasant. Are there any other views?

John: Yes, I must say I agree with James. The traders in town seem to do all right by buying grain from people like us, and selling it for more money. Why should we let them make all the profit?

James: Why indeed? I would say that our members trust us to use our judgement and intelligence on their behalf. We should hang on to the grain until the price is higher, and sell our produce for a decent profit.

Chairman: If we can, I agree. What do you think Paul?

Paul: I agree with Peter here. Our job is to process and market our members' crops, not to speculate. Let's sell the grain now and be safe.

James: Safe and poor, while the traders make the money. We have the space'and we can do without the money for six months more. Surely we owe it to our members to get the best possible deal for them.

Peter: What if the price goes down?

James: Anything could happen, the roof could fall in on our heads right now - the co-operative could fail - the stores could be burgled! We are in business, and that means taking risks like any other business. If people had always been cautious, our members would still be growing the same crops they grew a hundred years ago, and there wouldn't even be such a thing as a co-operative society.

Peter: I'm sorry, I must repeat my view. I've come here to protect our members, and not to gample their money away.

Chairman: Well, co-operators, I think we should put this to the vote. Peter proposed, and Paul seconded, that we should sell the grain right away. May I see those who are in favour? (Pause) That makes one, two, three, four. Thank you very much - and now those against? (Pause) One, two three, four. In the circumstances I must use my casting vote. I shall do this in favour of an early sale and I now declare the meeting closed. Good night fellow co-operators.

SESSION 5.3

MEMBER VIABILITY

Objective: To enable trainees (i) to explain the link between the success of society projects and viability of members' associated farming activities and (ii) to appraise the viability of projects accordingly.

Time: 1 to 2 hours.

Material: Case Study "The Pyrethrum Enterprise!'

Session Guide:

1) Distribute the case study and ask trainees to complete the assignment in groups. Allow up to 45 minutes for this.

2) Reconvene the group and ask group spokesmen to list their suggestions for possible reasons for failure. Do not ask each group to give its whole list. Obtain a list from one group and ask others only to mention items not already covered. Ensure that trainees focus particularly on the feasibility and profitability of members' pyrethrum enterprises, and do not make hypothetical comments on the drying plant which are not suggested in the text.

A possible list is as follows:

- The yield is expected to be $1,200 per hectare, and the cost of new plants will be $1,000 per hectare. This assumes a full year of cropping which will not be possible in the first year. Other costs are not covered. Members will almost certainly have to pay out more than they receive in the first year. If they do not have a cash surplus in hand, this may be impossible.
- Members will require information and an opportunity for discussion before deciding to grow pyrethrum. An announcement at the AGM is insufficient.

- It is unlikely that members will ask the Ministry of Agriculture for advice, since they do not know what advice they need at this stage.

- The expected yield per hectare from pyrethrum is double that for maize, but the view members take of the risk is rightly quite different from that of a larger organisation: crop failure to them may mean starvation and not merely financial loss!

- Members are unfamiliar with pyrethrum. They have probably not had any opportunity of seeing or talking to farmers who are successful pyrethrum growers. They will probably be unwilling to risk using land, which currently produces a food crop (with which they are familiar) to grow a cash crop which is entirely new to them.

- The change from subsistence to cash crop farming involves more than a simple comparison of the market value of'the two crops. Members may be unwilling to increase their reliance on purchased foods, particularly if they are familiar with shortages of farm inputs or other purchased items.

- The labour requirement for cultivating, picking and transporting the flowers may exceed the numbers of those presently underemployed. This is likely to be most true for the more progressive farmers, who are likely to start with the new crop, but whose families are probably better educated and thus otherwise employed.

3) Ask for suggestions as to how the project might be improved. These may include:

- Careful preparation and appraisal of the "project" which will have to be undertaken by each farmer. This must include cash flow feasibility as well as profitability.

- Arranging visits to successful pyrethrum co-operatives and farmers for members who are likely to influence and lead others.

- Cultivation of one or more demonstration plots to prove the technical feasibility of growing pyrethrum. This might involve delaying the dryer project for a season, in order to allow time for members to make their decision to plant pyrethrum.

4) Discuss with trainees how an individual's or a family's decision to undertake a project may differ from that of an organisation such as a co-operative or a company.

- The cost of failure may be hunger, withdrawal of children from school, loss of land or even starvation. This leads to a very different attitude to risk.
- An organisation can reasonably be expected to value immediate returns more than delayed returns, and to take this into account by using discounting techniques such as have been discussed. The organisation's money belongs ultimately to its owners who have entrusted it to the organisation for profitable employment. An individual may look further ahead and may for instance wish to leave unexploited resources for his children or even for further generations. A family might exploit a quarry (or an oil well) far more slowly than an organisation.
- The form of resources is often more important to an individual than their value.
    - A tractor may be worth more than ten cows, but it cannot easily be divided between five children on the owner's death or retirement.
    - A small holding, intensively farmed, may yield a higher return than a poorly exploited larger farm. Still a family may prefer to continue to (poorly) exploit a larger holding because their ancestors may be buried on the land which therefore cannot be sold.
    - A large herd of traditional cattle may be less valuable financially than a smaller number of graded animals, but they may be more valuable in terms of status, bride price or dowry.
    - The employee of an organisation must work for the interests of the organisation. His personal affairs are quite

separate. A private individual running his own farm or other business will choose projects which suit his preferred life style which are not necessarily those which maximise his immediate income.

These facts are difficult to take into account, but co-operative projects usually depend on members' own "projects". Co-operative management must therefore ensure that these individual members' projects are appropriate and feasible, thus ensuring they will be successful and will provide the necessary inputs for the co-operative project itself.

The Pyrethrum Enterprise

The manager of the AFS was confident of the success of the new Pyrethrum Drying Project which was to be implemented. He had calculated that the project would yield over 35% on the investment to be made, and there was no doubt that the society's financial position and reputation would benefit from it.

The society had 500 active members. They generally farmed about two hectares each and most members grew maize, the national staple crop. Whatever surplus they had beyond their own consumption needs was sold through the society. A number of members also had a few head of cattle for meat and milk. This was consumed locally and not marketed through the society.

The project involved the installation of a plant_ to dry pyrethrum. This crop produces flowers from which insecticide is eventually extracted. It was known that pyrethrum grew well in areas with similar climate and soil conditions. It had not been grown before in the AFS area because it was essential that the flowers should be dried within two or three hours of being harvested. Without a local drying plant this time could not be achieved. The dried flowers would be sold to a co-operative based extraction plant at a price which guaranteed a good return. The rising oil price, coupled with increasing suspicion of chemical insecticide, meant that the market was secure and growing.

The dryer would cost $10,000 to buy and install. It would process about 100,000 kilograms of flowers per year. The machine was widely used in other parts of the country and costs of operation could easily be covered by the difference between the price paid to farmers and the price paid to the society by the Pyrethrum Board.

The average yield per hectare would be about 800 kilograms. The manager calculated that 125 hectares of pyrethrum should satisfy the demand. It seemed reasonable to expect that members would devote at least that amount of land from their total holding of around 1,000 hectares, to the new crop.

The manager's confidence was partly based on the increased income which he estimated that members would receive if they started growing pyrethrum. He estimated that the produce of one hectare would sell for around $1,200, whereas maize grown on the same hectare of land would only sell for about half this sum. The manager had enough respect for the judgement of his members to believe that they would be only too eager to plant pyrethrum. In fact he was rather worried lest too many members plant the crop and he wanted to be sure that a second dryer could be installed at short notice if necessary.

Pyrethrum plants cost five cents each and it was recommended that they should be planted at a rate of 20,000 per hectare. The plants required regular cultivation prior to maturity, then flowers could be picked about every two weeks almost throughout the year. This meant a far steadier labour requirement than maize, which needed two weedings and harvesting, but little other attention. This seemed to be another advantage in addition to the high revenue per hectare, since members' families were underemployed.

Members would be able to obtain the plants on credit from the society. The cost would be deducted from their receipts during the first year. The local director of the Ministry of Agriculture said that he would be able to provide expert advice on pyrethrum cultivation to any members of the AFS who asked for it. There seemed, in fact, to be no outstanding problems whatsoever.

The society therefore arranged the necessary long term credit and placed an order for the dryer. It would be installed and ready for operation within nine months, by which time members' new pyrethrum planting should have started flowering. The decision was announced at the Annual General Meeting and the manager confidently wrote the increased surplus into the budget for next year's operations.

Assignment:

1) Identify possible reasons why the project may not succeed.

2) What improvements might be made to increase the chances of success?

SESSION 5.4

HUMAN FACTORS

Objective: To enable trainees to distinguish the "human" from the technical and economic risk factors in any project, and to take appropriate steps to minimise them.

Time: 1 to 2 hours.

Material: Case Studies.

Session Guide:

1) Distribute the case studies and allow trainees in groups up to one hour to complete the assignment.

2) Reconvene the group and ask one group to suggest their answers to questions one and two for case study one.

Case Study One

Problem:

The equipment scheme depends entirely on the effective formation and operation of the farmer groups. Experience suggests that groups of this sort rarely succeed when imposed from above.

Possible Difficulties:

- Groups unable to decide which farmer should have preference, when the equipment is most needed.
- Groups unable to determine responsibility for repair and maintenance.
- Groups unable to determine, collect and pay in regular payments.

Possible Solutions:

- The search for more "appropriate technology", the tools of which can be economically owned and used by one farmer.

- Encouragement of private ownership of machinery by leading farmers. They could provide contract service to other members. The co-operative could provide financing for these contract services.

- Establishment of machine depots, controlled by the society and operating a number of machines to cover a convenient area.

3) Ask a second group to suggest their answers for case study two.

Case Study Two

Problem:

Large organisations, whether owned by private interests or government, are notoriously unreliable. Statements of good intentions or even signed agreements, are no guarantee of action. Problems of co-ordination may arise so that even if the facilities are available, they cannot be effectively integrated.

Trainees will be familiar with problems arising from lack of co-ordination between ministries and other organisations. Liaison committees and copies of memoranda are generally ineffective remedies.

Different organisations have different priorities and if there are shortages there is no reason why this particular project should receive preference.

There is no clear leadership and any credit for success will accrue only to the society itself, and not to the other organisations on which the success will depend.

Possible Solutions:

- Whenever possible, two or more suppliers should be arranged for every product or service. This will provide alternatives in case of failure and will also establish the leadership role of the society which will be in a position to choose from one or more suppliers.

- "Fall back" facilities should be arranged as second best, but with feasible alternatives for arrangements such as the loan of classrooms.
- There must be clear leadership of any project, particularly one which involves a number of different autonomous organisations.
- If costs, finance and management resources allow, a society should attempt to satisfy its own needs for products and services rather than relying on other organisations. If it is necessary to use outside organisations, their services should be purchased on a supplier/customer relationship basis, rather than provided on a goodwill basis.

4) Ask a third group to suggest their answers for case study three.

Case Study Three

Problem

Successful farming requires four important factors:

- Land
- Physical Inputs
- Labour
- Farmer Skills

Farmer skills can be divided into two general categories, i.e.:

- Knowledge of the necessary technical facts.
- Ability to apply the facts and to manage the complete enterprise.

The project as outlined ignores farm management ability. Members are unlikely to be able to manage the far more complex activities of modern farming at short notice and without extensive guidance.

Possible Solutions:

- If possible, new inputs and technology should be introduced gradually, enabling farmers to cope with one new set of circumstances at a time.

- Farmers' existing management ability should be measured by relating their present output to their resources. New techniques should only be introduced to those who have shown themselves able to make the best use of what they have already.
- An integrated information and guidance package, consisting of demonstration plots, periodic classroom instruction, and intensive guidance from field advisers should precede and accompany the physical inputs.

5) Remind trainees that the human factor is:

- the most likely to vary;
- the least likely to be predictable;
- the most difficult to direct;
- the most important determinant of results.

Ask trainees to "place" farmers in their area along the following lines:

Dishonest	_____	Honest
Jealous	_____	Co-operative
Suspicious	_____	Trusting
Idle	_____	Energetic
Conservative	_____	Enterprising
Sheep Like	_____	Independent
Stupid	_____	Intelligent
Short Sighted	_____	Far Seeing

Discuss

- Why should co-operative managers sometimes "place" members to the left hand end in such an exercise?
- How can such a changed perception of members by managers modify projects?

Case Study One - The Group Machinery Plan

It was clear that the members of the AFS needed some form of mechanisation in order to enable them to make use of the new seed varieties which were becoming available. Other societies had had unsatisfactory experiences with tractor hire services and the committee was determined to avoid the sort of problems associated with these.

It was therefore determined that members would be encouraged to form small groups of between ten and twenty farmers. Each of these groups would be provided with a small-scale tractor, on medium term credit. It was hoped that there would be eventually ten or twenty such groups. They would be responsible for all the aspects of owning the tractors including (i) repaying the loans, (ii) deciding who should use them and (iii) ensuring that they were maintained in good order. The secretary was asked to communicate with farmers with a view to encouraging the formation of groups of this sort.

Case Study Two

The secretary of the AFS was very satisfied with the reactions from the various agencies whose help was needed to introduce the new seed varieties to his members successfully.

The new varieties would undoubtedly bring enormous benefit_ but members would need a great deal of help before being able to take advantage of them.

- The Ministry of Education would have to lend classroom facilities.
- The Ministry of Agriculture would have to provide extra extension services and instructors for classroom training sessions.
- The Agricultural Bank would have to provide extra management and a special short term credit package.
- The Ministry of Commerce would have to ensure that the trade channels, both private and publically owned, were ready and willing to purchase the extra production which was expected.
- The Central Bank would need to allocate special import licences.
- The railways would have to ensure that sufficient wagons were available, both to deliver the necessary inputs and to take away the crops.

The secretary had convened a meeting, inviting representatives of all the interested agencies. Every agency had sent a representative. It was agreed that a liaison committee would be set up, with chairmanship rotating among the various agencies. Copies of all correspondence relating to the new project would automatically be sent to every organisation by all the others.

The secretary was very happy with the goodwill and interest which was expressed and he proposed to go ahead with the implementation of the project as soon as possible.

Case Study Three

The members of the AFS enjoyed one advantage which was not shared by most farmers in the country. Most of them had additional land which needed only to be cleared to be brought into production.

The secretary was anxious to introduce a new and potentially highly profitable cash crop to the members. It required a number of new inputs and new cultivation methods, but was known to grow well in the region. To get good results, the crop should be grown on virgin ground. The secretary also appreciated that members might be reluctant to diminish the area devoted to other crops in favour of something that was unfamiliar to them. He therefore proposed a scheme whereby credit was made available to members for clearing additional land. He also ensured that the necessary short term credit was available, that the appropriate inputs were identified and put into stock and that the necessary technical information was made available. There was no problem about marketing the new crop and he was confident that the farmers would extend their farms and make good use of the opportunity that was being made available to them.

Assignment:

1) Identify difficulties which may arise in the course of implementing the three projects described.

2) Suggest possible solutions which may overcome these difficulties.

SESSION 5.5

PROJECT PRESENTATION

Objective: To enable trainees to present projects to potential sources of finance or other authorities in an effective way.

Time: 3 to 4 hours or more, depending on group numbers.

Material: Information from trainees' own societies.
Handout: The Agrarian Farmers' Society: Proposal for the installation of a Grain Storage System.

Session Guide:

1) Ask trainees to describe how their societies present projects to banks or other sponsoring authorities. Which of the following stages are included in the procedure leading to final approval or rejection?

   - Preliminary informal discussion to obtain initial reactions and guidance.
   - Preparation and handing over of a detailed written report.
   - Personal presentation of the project, to highlight salient features of the report and to respond to questions and suggestions.
   - If necessary, revision and resubmission of the report, possibly with further presentations.
   - Final approval or rejection.

2) Trainees may not be familiar with formal written or personal presentations of investment proposals. The actual procedure of project appraisal always involves informal semi-political activities. It should not be suggested that the process can or should be wholly open, rational and based on dispassionate quantitative appraisals of costs and benefits.

3) Ask trainees to suggest advantages and disadvantages of the "informal" aspects of project appraisal.

Disadvantages:

- Project appraisal may be delayed by interminable political negotiations and lengthy discussions.
- Projects may be approved because they happen to be in areas represented by people of particular influence, rather than because their rate of return is the highest, or they benefit the largest number of people.
- There is no clear, open and rational basis for project selection, hence corruption can easily go undetected.
- The poorest people, most in need of help, are usually the least capable of mobilising opinion in their favour. Informal methods of project appraisal perpetuate and exaggerate regional inequality.
- There is no incentive for managers to plan projects carefully, because appraisal is not based on objective facts. If projects are approved, the lack of planning will lead to poor implementation.

Advantages:

- In a genuinely democratic society, the largest number of people can make the loudest "noise". Projects benefitting the largest number may therefore be approved.
- Projects which lack political support often fail even if they are initially approved. Informal approval can ensure continued support.
- In the end, estimates of future results are always a matter of opinion. Endless arguments about details of data can seriously delay project approval, and occupy expensive staff and other resources.
- Incompletely prepared project proposals, or those including serious mathematical errors, can lead to serious misallocations of resources. Informal processes are more effective than incompetent quantified appraisal.

- Statistics can be manipulated by skilful analysts in such a way as to support any project, particularly if the decision makers are not familiar with the mathematical techniques employed.

The objective should be to maximise the advantages and minimise the disadvantages by developing an effective mix of informal and formal methods of project appraisal.

4) Ask trainees to suggest an appropriate set of headings or chapters for a project proposal document. Elicit headings from trainees and write a list approximately as follows on the chalkboard/OHP.

- A.one page "executive summary", stating in particular:
  - what is recommended;
  - how much money is required;
  - what rate of return the project will earn.
- A statement of the problem or reasons for concern which have given rise to the project.
- A brief concise statement of the objectives of the project.
- A brief account of the history of the co-operative society which proposes to implement the project and of its financial and management resources.
- A brief description of alternative ways of achieving the objectives.
- A summary of the results of the calculations and other considerations which led to the selection of the project actually being proposed rather than the alternatives.
- A detailed description of the project, including (i) a technical survey, (ii) the associated costs and benefits and (iii) a timetable for implementation, (iv) calculation of the rate of return.
- A statement of the project financing arrangements, from the point of view of the bank or other financing organisation, showing the timing of disbursements and repayments.

- Financial statements for members' new enterprises which will be associated with the project.This will show the viability both in terms of cash flow and rate of return.
- A list of other organisations whose collaboration will be essential for the success of the project, including suppliers of physical inputs, credit, advice, training and marketing services.
- "Sensitivity analysis" summarising the effect of likely combinations of misfortunes on the viability of the project.
- A statement of how and at what stages the project will be evaluated.

Distribute copies of the handout.Remind trainees of the grain storage problem and go through the proposal with them. Ask them to comment on its content and layout.

5) Ask trainees to imagine that they are potential supporters of a project. They have received and briefly studied a written proposal such as is outlined above. What more would they want before making a decision?

- An opportunity to meet those responsible for the project, in order to appraise their seriousness and apparent ability to implement it successsfully.
- An opportunity to put further questions to the project's proposers in order (i) to clarify any uncertainties, (ii) to obtain any missing information and (iii) to ensure that the proposers have anticipated all possible problems.

These needs can be satisfied by a personal presentation to a panel of potential supporters by the project's proposers.

6) Ask trainees how they would structure a personal presentation to a group of bankers or other potential project sponsors. If they had one hour with such a panel, how would they make the best use of the time?

- Ensure that all those present received a copy of the written proposal some days before the personal presentation takes place.
- Start the presentation with a prepared and highly polished 15 minute summary of the project, making effective use of visual aids to show the panel the nature of the project, and to pro vide any who have not read the proposal with a basic survey of what is involved. (This should not involve reading out parts of the proposal, since panel members will be offended if the proposers suggest that they have not read the proposal.)
- Invite questions. If these reveal that panel members have not read the written proposal, do not make them look foolish when answering the questions.
- Ask panel members for advice on any aspects of the project which appear likely to cause problems. The advice will be useful, and potential supporters are always more favourably dis posed towards projects to which they feel they have given advice.
- Ensure throughout that the panel members feel they are in charge of the presentation. Its objective is to satisfy their need for information, not the proposers' need to prove their own skill or knowledge.
- Conclude the presentation by a summary of what is needed from the panel.

7) If time allows, and if some trainees at least have access to the necessary information, trainees in groups or individually should prepare written and personal presentations as outlined above for projects under consideration in their societies. They should present them to the rest of the group for appraisal. It may be possible for small groups of trainees from different societies to work together by helping one of their group to put together a proposal. These proposals can be presented to the rest of the group and their comments and suggestions can be incorporated in the final proposal to be made to the actual bankers or other sponsors. If this is possible, the following session 6 may be omitted.

8) If trainees are not in a position to obtain data on actual projects, one group of about five people should be asked to act as the committee of the AFS and to present the grain storage proposal to the remainder of the trainees, who should act as a panel of critical bankers who are being asked to finance the project. The committee may modify the sample proposal if they want to.

The committee should attempt to follow the procedure outlines in 6) above, while the bankers should comment on the following points especially:

- If the committee uses shadow prices ensure that they are able to explain clearly what they are doing and why. The bankers may not be familiar with that technique.
- Ensure that they explain the discounting procedure clearly.
- Ensure that the comittee has carefully investigated all likely misfortunes, and they know at what point the project would not be viable.
- Ensure that the committee prepares a timetable plan showing specific targets to be reached at certain intervals prior to the implementation of the project.

The Agrarian Farmers' Society

Proposal for the Installation of a Grain Storage System

1) Summary

It is proposed to install a semi-mechanised grain storage system, using five concrete bins and a mobile conveyer belt, in order to reduce the present wastage of 5% by half. The investment will be $19,000 and the net savings are estimated to be $5,500 per year.

2) Problem

Members' grain is currently stored under cover on the ground. It is estimated that losses of 5%, or approximately 200 tons per year, occur as a result of damp and vermin. At present prices this amounts to $20,000 per year, and it is expected that the loss will increase as members' production and market prices rise in the future.

3) Objective

The objective of the project is to reduce grain storage losses as much as is economically possible, and in such a way as to allow for future expansion of capacity if necessary.

4) The AFS Society

The Agrarian Farmers' Society was started in 1970. There are 400 active members, who market all their surplus grain through the society. The total volume amounts to approximately 4,000 tons/year. The society has made a surplus and a redistribution every year since its inception.

5) Possible Alternatives

The following alternatives were identified and investigated for comparison purposes:

a) Do nothing: this would allow the existing wastage to continue, but would avoid any capital expenditure. No new employment would result.

b) Install the concrete bin system: this involves capital expenditure of $19,000 and net annual savings of $5,500. Four full-time and eight part-time workers will need to be employed.

c) Install fully mechanised steel-bin system: this involves capital expenditure of $20,000 and net annual savings of $12,000. Two full-time and two part-time workers would be required.

6) The rate of return of the two projects has been compared using unadjusted financial figures and using the following adjustments:

- unskilled labour costs: halved to take account of the need for employment and benefits created through new jobs.

- land costs: eliminated since the land belongs to the AFS trust fund anyway.

- input costs: doubled to take account of the scarcity of foreign exchange.

The results of the calculations, using adjusted and unadjusted figures are as follows:

Basis of Calculations	Concrete Bin System	Mechanised Bin System
Unadjusted figures	26%	over 50%
Adjusted figures	32%	27%

7) Technical Data

Detailed technical data on the proposed system is given in the annex to this proposal (not included).

8) Financing

The Co-operative Bank has informally agreed to lend the AFS the capital sum necessary to finance the construction of the system.

9) Effect on Members

The savings from reduced wastage will be passed back to members through distribution of the resulting increased surplus. Members' existing grain enterprises are profitable, and they are increasing both the area and intensity of growing cultivation. The proposal does not involve any new types of activity on the part of the members.

10) Other Organisations

The National Maize Produce Board (NMPB) is anxious to purchase all grain available, and no problems are foreseen in marketing the grain which will be saved. The equipment manufacturer has supplied similar conveyers and storage bins to other societies in the past, and it has been ascertained that they are very reliable. The availability of spaces and servicing is known to be first class too.

11) Risks

Should the expected improvement be only half of what is expected, the concrete bin system becomes unviable. In such a case, the financial return based on unadjusted figures becomes negative and subsidising will become necessary. The rate of return on the fully mechanised steel bin system drops to approximately 14%, using unadjusted figures.

12) Evaluation

The costs of installation and operation, and the actual wastage rate, will be closely monitored and controlled. Figures will be summarised annually to demonstrate the relationship between forecast results and actual operations.

topic

6

action learning and commitment

Session 6 Action Learning and Commitment

SESSION 6

ACTION LEARNING AND COMMITMENT

Objective: To enable trainees to apply what they have learned to projects in their own societies.

Time: Depends on group members.

Session Guide:

1) If time or the lack of information prevents trainees from preparing and presenting complete project proposals along the lines suggested in the previous session, they should nevertheless be given the opportunity to state how they propose to apply what they have learned in their own societies.

Many thousands of people have been trained as project analysts throughout the world but most projects, in most countries, are still badly prepared, and are approved entirely through the sort of "informal" methods which were described in the previous session. Ask trainees to suggest why this may be so.

- It is difficult to teach the techniques of project appraisal. It is far more difficult to teach people when and how to apply them.
- The techniques are often complicated and difficult to explain. Someone who has learned to apply them himself cannot necessarily explain them convincingly to other people.
- A manager who is the only person in his organisation to understand the techniques of project appraisal may feel nervous about introducing them to his colleagues, or reluctant to do so for some other reason.
- Some managers or committee members may feel that objective, quantitative decision-making techniques deprive them of their power and influence.
- The pressure of work, particularly when participants return from a course, may prevent newly trained project analysts from exercising their new skills.

- Powerful people who have a financial interest in how projects are currently approved may be in a strong position to resist any more honest methods of appraisal.

2) Ask trainees how they feel they can overcome these, and other similar problems, when they return to their societies.

- By carefully and selectively identifying projects which can gain most from the techniques they have learned, and which will effectively demonstrate the value of such techniques.
- By enduring now that not only can they carry out the various techniques they have learned, but can also explain their advantages to other people.
- By resisting the temptation to introduce new techniques too quickly, without explanation.
- By avoiding any impression that they believe that they alone understand how to select good projects, and that other people are woefully ignorant.
- By maintaining contact with other people on the course for mutual support.

3) 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.

Ask trainees to consider the timing of costs and benefits associatdd with this course:

- the costs have now all been incurred;
- no benefit whatsoever has yet been gained.

The last session must therefore be seen not as the end of a successful course, but as the beginning of individual activities by trainees which will eventually more than repay the money and time that has been invested.

Remind trainees of the total cost of their attendance at the course as estimated in the second session. Why is it necessary for each trainee to aim at a considerably greater amount of benefit in order to justify his attendance?

- The problem of timing: the benefits will be later than the costs and depending on the discount rate, must therefore be proportionally greater.
- The problem of risk: some trainees may be transferred to other jobs where they may be unable to apply what they have learned. Others may be totally frustrated. Successful trainees must therefore more than recover their own cost of attendance.

4) 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. If possible individual advice aimed at helping them put this together should have been given throughout the course.

Appropriate projects might be as follows:

- To prepare and appraise a methodical project proposal on a particular investment which is under consideration in a trainee's society at the time.
- To suggest to their society that in future all investments over a certain sum should be subject to an appraisal system along the lines learned in this course.
- To prepare and present to their committee a proposal for modifying the costs of labour and imported goods in statements of costs and benefits for proposed projects, in order to achieve employment and "balance of payments" objectives.

- To carry out a survey into members' intentions, before deciding to introduce a particular service.

5) Allow each trainee up to 15 minutes to present his action commitment, and a statement of how he proposes to "sell" the plan, not only to his chairman and committee members but also to sub ordinates. Even if subordinates can be forced to do what they are told, they will not work effectively unless they believe in what they are doing.

Warn trainees that, if at all possible, the instructor will visit each trainee at about the time he has nominated for completion of a particular stage in his action plan. The objective will be to measure the effects of the course itself, not to evaluate the trainees.

6) If possible, arrange for a brief reunion to be held at a convenient time and place about six months after the course. This can provide an opportunity (i) to share the experiences the trainees have had in attempting to apply what has been learned, (ii) to describe progress in implementing action plans and (iii) to exchange ideas for more effective project appraisal in the future.

If possible and appropriate, prepare and distribute a paper giving names and addresses of all participants, and summarising the details and completion dates of the action commitments.