Business Management for Small Scale Mechanization

A training program for hire service providers
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Understanding the basic concepts of business management is vital for hire service providers to analyse how a business performs and can be improved. This can help to locate weaknesses in the business and to correct them. It can also highlight areas within the business that are performing satisfactorily and can be further developed. This module is intended to provide hire service providers with an understanding of the basic concepts and tools needed to take decisions on the management of the hire service business. It introduces the participants to the overriding concepts of the business model, entrepreneurship, profitability, fixed and variable costs, depreciation, cash flow, risk in business, competition, setting hiring charges, budgeting, break-even analysis, capital investments, investment appraisal, loan appraisal, record keeping and developing demand.
1. INTENTION OF THE MANUAL

This manual is intended as a training programme for the trainers of hire service providers in business management. Hire service providers, who are interested in entering the business, lack any formal training in the principles of business management. The materials developed in this manual are intended to enable hire service providers to understand their business and the complexities of business management. This manual is intended for prospective trainers of hire service providers and, as such, has been designed as a Training of Trainers manual. Following this training programme, it is expected that trainers will be well equipped to train, mentor and assist hire service providers already in the business or intending to start their own hire service business in the management aspects of small scale mechanization.

2. WHO SHOULD USE THE MANUAL?

These sets of materials are written for local level trainers who are expected to train hire service providers. The trainers should have a strong background in farm mechanization and economics/business management and experience in curriculum development. The trainers will be tasked to adapt/translate the training materials for use at local level in training, mentoring and coaching service providers. In order to kick-start this process, the trainers may need to be guided by the experts responsible for the preparation of these materials.
3. THE CONTENT

The training manual has been prepared as a package of materials that include an instruction guide for trainers and handouts for participants. The manual has been written and prepared as self-instruction materials for trainers, with clear explanations of the concepts and tools used, supported by practical examples and exercises.

The training programme covers 4 modules and 16 sessions, covering a range of topics with exercises and handouts. Given the comprehensive scope of the work the content should be treated as reference materials. There is no definite time given for the training course as the materials are expected to be used as determined by the training team. The main module titles are shown on the right.

This schedule should be adapted as necessary by the trainers prior to beginning the training program. The manual is intended to provide mechanization hire service providers with:

- an understanding of small scale mechanization and the hire service business;
- an understanding of the concepts of economics and the applications for making business management decisions; and
- methods to analyze the performance of the hire service business, make investment decisions and prepare business plans.

It should also be emphasized that the manual is not intended to supplant or replace the trainers' own ideas or experience, but to complement them.

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4. **Duration**

With 16 sessions, the materials in this package are comprehensive and as such should be regarded as reference materials for the trainers to adapt to local circumstances. However, an indicative 4 day training programme could comprise a reduced list of modules and sessions as given below:

<table>
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<th>Module Title</th>
<th>Session no.</th>
<th>Session Title</th>
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<td>Understanding profit and profitability</td>
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<td>3.3</td>
<td>Capital investment</td>
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<td></td>
<td>Management</td>
<td>3.4</td>
<td>Understanding cash flow</td>
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<td>3</td>
<td>Management</td>
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There are no set timings for each session as the time would vary depending on the content selected, the level of the participants and the amount of detail covered. The trainers should be encouraged to adapt the length of the training and the content to the time available to them. In general five days would be adequate to deliver the essential materials. However, the duration and scheduling of course segments may need to be adapted to match trainee requirements and experience.

A longer course may be designed over a longer period with class meetings held only on certain days each week or in the evenings or weekends. Conducting a course between longer breaks has the advantage that the participants would have more time to absorb the lessons presented and it would enable them to relate what they are learning to their everyday work. This would help to reinforce the practical value of the programme. However, a programme conducted in this manner may result in some loss of continuity. This might require additional planning and possibly a rearrangement of the order given in the manual.
5. Training Process

The manual is built around the concept of experiential learning. During the training, the trainers will present the material, lead discussions and facilitate classroom and field exercises. The training process calls for some field exercises during the training meetings. When field exercises are expected to be conducted, the participants will report back on lessons learned in the field application during the following training meeting. This dynamic process encourages horizontal learning, as well as feedback from the trainer, and makes the training content immediately relevant within the workplace.

The training course is expected to be improved by occasional contributions from outside experts in specialized subjects. Visitors of this sort should be invited to contribute if their detailed knowledge is relevant and if they are known to be effective communicators and experts in their subjects. Their contribution will complement the sessions guided by this material.

6. Structure of the Programme

There is a trainer’s guide at the beginning of every session. The guide to trainers is preceded by four parts: introduction, learning objectives, key questions and key points. Each session also contains handouts for distribution to course participants. The introduction sets the scene for the topics included in the module and gives them focus.

This is intended to help the trainer prepare for the topics and to place the content in the right context. The learning objectives specify what results the participants are expected to have achieved after the session and the key questions section specifies the questions and issues to be addressed. As the title implies, the key points lists the main concepts to be taken up in the session. The instructional content includes a guide to trainers that explains how best to deliver the material to the participants. This gives the trainer an idea of the topics to be prepared for before facing the participants. Where appropriate, certain sessions include one or more training exercises for the participants to complete during that session.
7. Layout of the Exercises

To make planning the exercises easier, each exercise is presented in the same format as set out below.

**LEARNING OBJECTIVES:** There is a clearly stated objective for each exercise. Each exercise is designed to achieve discrete and specific outcomes that will generally be either knowledge or a skill. Most exercises have a single objective; some will have two.

**KEY QUESTIONS:** There is at least one key question to explore for each exercise. Each exercise examines at least one question that is worded to help focus the thinking of the participants around the objective of the exercise.

**KEY POINTS TO COVER:** For each exercise key points to cover are presented in bullet points. Each exercise is designed to cover a number of points that will help answer the question and fulfill the objective of the exercise. In most cases these points are presented in bullet form; in a few cases they are presented as a brief narrative explanation. They are not meant to be exhaustive, but are meant to present the essential learning that is needed. Trainers may need to adjust the key points to suit their particular circumstances or the circumstances of the participants.

**TRAINER’S GUIDE:** For each exercise steps for processes are suggested. The exercises are designed to help participants gain some knowledge or skill. For each exercise a brief description of the way the exercise is to be carried out is given. The details and the specific methods of the process (such as group sizes, use of materials, whiteboards, etc.) are left to the discretion of the trainer based on his or her knowledge of the local circumstances. Where possible, the process is meant to be interactive and/or experiential – giving the participants an opportunity to ‘do something’ and to contribute to the learning.

The general procedure is to explain the purpose/objective of the exercise, provide the participants with information, explain the steps of the exercise, have the participants complete the exercise, and then to discuss the outcomes in a plenary discussion as a means of consolidating learning. Some of the exercises include suggested guidelines that provide a sequence of steps to follow.

When group work is indicated, it is suggested that this be handled in two stages. The first stage would be work to be done by the designated groups (e.g. discussion, planning, etc.); the second stage would be presentations by the group followed by discussion by the plenary of the participants. The intention is to maximise input and participation (through the groups) and to reinforce learning (through collective reflection and dialogue). Some of the exercises refer to groups or teams. These are groups or teams of participants who are working on the same topic. Organising such teams will make the relevant exercises easier to conduct and for the participants to assist one another in the exercise.
8. Preparing for the Training Programme

Preparation

Preparation is a key factor to the success of this programme. The interactive nature of the exercises requires that the trainer be well prepared in advance. The trainer should read the manual carefully well in advance of the training programme. Most of the exercises will work in a wide variety of circumstances. However, the manual cannot cover all eventualities. Special attention needs to be paid to preparing the practical field exercises. These will require significant thought to guarantee the availability of machinery and equipment, its proper functioning, and selection of cases to be used, as well as to guarantee that the logistics of the field exercises are well prepared.

Trainers must study every session carefully and pay particular attention to adapting the material to local conditions, including local information and local units of measurement. The subject matter must be checked carefully and calculations must be worked through in advance of the training so that they may in turn be explained to the participants. PowerPoint presentations could be used and should similarly be checked and tested. The training content and handouts must be reproduced in sufficient quantities and distributed to all trainees.

Adequate time should be given before conducting the training so that the trainers can assimilate the material to be conveyed and ensure smooth delivery.

Adequate time should be given before conducting the training so that the trainers can assimilate the material to be conveyed and ensure smooth delivery. The participants should also be given adequate time to read the handouts. Note that in the section “Trainer’s guide for instruction” it is noted that handouts should be distributed before the start of that session.

The session guides are written in some detail, but the instructor need not follow them exactly. The overall theme of each session might be likened to a basic tune. Each player must interpret it as s/he thinks fit, leaving out some parts, adding others, and varying the sequence, the methods’ and the pace according to individual preferences and skills, the needs of the group and the moment-by-moment situation in the classroom.

The course might not be conducted in English, and trainers should realize that it is far more important for them to be able to communicate with the participants in their own local language than to be able to follow a training course in English. In that case, all the Handouts should be adapted to the local situation and abbreviated to capture the most salient aspects. The handouts will need to be translated before the course begins. Even if the course is in English, it will probably be necessary to make changes to the names, crops, sums of money and other aspects of many of the case studies and exercises. The trainer should also remember that the best examples are those which come from the participants' or the trainer’s own experience.
Training needs and wants assessment

As mentioned earlier, the training materials should not be used as a comprehensive set programme. It follows a basic outline and broad sequence of learning, but it does not specify which of the exercises provided in this package of materials should be used. One of the key elements of the approach is that the actual programme followed should be based on a sound assessment by trainers of the knowledge and skills that existing or potential hire service providers – participants – have in farm mechanization and business management. Thus it is strongly recommended that a training needs and wants assessment be conducted amongst interested prospective participants. This guidance note does not prescribe a particular form of assessment as the core trainers in each country or locality will know best how to conduct such an assessment. Indeed, such an assessment may have already been conducted.

In addition to assessing training needs, it is important also to assess training wants. Very often participants have very clear and specific interests regarding what they want to learn to improve the profitability of their business. If the training programme can address these wants, it will build greater confidence among the trainees and improve their level of participation.

Introduction and evaluation

The course should start with a session designed to introduce trainees to one another, clarify the training objectives and the trainees’ expectations of the course, co-participants and resource persons and clarify ground rules on the conduct of the training. The training should include a session to review the course content.

The course should also include an evaluation. In the interest of consistency, if for no other reason, training conducted with the use of this material must be evaluated properly. The trainer could consider ending each module with a short evaluation segment that requires the full participation of the trainees. This should summarize the achievements of the session and also inform the trainer of ways to improve the course delivery.
Session 1.1. Understanding business models

A business model is essential for any hire service activity in order to make money and develop as a business. The key to a business model is to develop what is called a value proposition. The value proposition is the reason why customers should select a particular hire service provider rather than another. It relates to the answers to questions such as: what is more special about one specific hire service business? Is that business equipped with any special machinery or device? Does it offer after sales services or any other benefit? The business model explains how a hire service business offers its service to customers, how it relates to other businesses (and their customers), gets the resources needed to generate income, reduces costs and ensures the financial sustainability of the business. The concept of a business model is described in Handout 1 and a practical exercise has been devised to illustrate how a business can be analyzed. This session also introduces the participants to the Business Canvas, a format for better understanding the key elements of the business.

Learning Objectives

- To understand what a business model is
- To learn how to use the Business Canvas

Key Questions

1. What is a business model?
2. What are the key elements of a business model?
3. How can a business model be analyzed?
4. What questions should I ask about the business? (e.g.: who are my target customers, what is my value proposition, who are my partners etc.)
5. What strategies are necessary to upgrade the business model?
KEY POINTS TO COVER

• The supply chain looks at the whole mechanization system, while the business model focuses on key links between the hire service business and its customers.

• The business model should be understood as a way to make a hire service business self-sustaining.

• The hire service business model can be divided into parts or components that include:

  ➡ Customer segments: A hire service can target different customers. For example, small farmers involved in dry farming systems, medium scale farmers involved in irrigated farming or even customers that are not involved in farming but wish to use hire services for the transport of goods or people.

  ➡ Value propositions: The value proposition relates to the service that the business provides and shows the difference between the services offered and others. It should aim at addressing customers’ needs. Value propositions are delivered to customers through communication, information and distribution channels.

  ➡ Channels: Channels refer to how the hire service business interfaces and reaches its customers.

  ➡ Customer relationships: Should be set up and maintained for each group of customers (customer segment).

  ➡ Revenue streams: A stream of income from customers paying for your services (that is the result of the value proposition).

  ➡ Key resources: The resources that the hire service business has at its disposal to operate the business. These include physical, financial and human resources.

  ➡ Key activities: The actions needed to create and sustain the value proposition, maintain customer relationships, and create an income. Examples of activities include planning, procuring, organizing, monitoring and delivering quality services.

  ➡ Key partnerships: Some activities and the access to resources can be affected by the relations between supply chain actors and partners.

  ➡ Cost structure: The costs that the hire service business incurs.

• How can the business be improved? What is needed to increase the profitability of the business and make it competitive over time?
1. Explain the purpose of the session. Have the participants review handout 1 and especially the business canvas chart. The trainer should describe the chart starting from the box “What do you do”.

2. Ask the following questions to the participants:
   • What is or will be your objective? Is it to deliver a service or product to farmers? What type of service and to which farmers?
   • What problems or challenges is your service expected to address?
   • What needs is your service expected to fulfill?

3. Provide an example and ask: If you charge $16 for a seeder/ripper to cover 1 hectare, is it more likely for the customer to save money or time?

4. Ask the participants who is more likely to be their main customer if they provide the seeder/ripper service? For what size of holding and what type of crops?

5. Ask the participants what resources they would need to set up their business? This could include money, machines, manpower and training.

6. Ask the participants to think about their strengths (e.g. good relation with people, a good reputation, good business skills).

7. Ask the participants who they would approach if they needed assistance (e.g. agricultural extension services, research and development centers or support staff such as dealers, mechanics, etc.).

6. Ask the participants how do they look for customers? How do they maintain relations with existing customers? How do they work with their customers? Do they interact directly or through operators or agents which work on a commission basis? How do they find spare parts dealers?
9. Ask the participants how they calculate their costs. What costs they need to take into account - machine breakdown costs, repairing costs, transportation costs, labor costs.

**No need to mention the amount, just the type of costs.**

10. Ask the participants how do they estimate their revenue or income, how do they set their charges and for what items.

11. Divide the participants into groups (according to the technology) and get them to identify a particular hire service business that they are familiar with (e.g. land preparation and tillage services/shelling/milling/transportation).

12. Distribute a copy of the Business Canvas (Handout 1.2) to each group and get the members to formulate some key questions to better understand the business model segments. Have the groups understand the experience of the business in selling either machinery goods or services.

**Note to the trainer:**

Write the following questions on the board and get the group to brainstorm the answers and place them in the relevant boxes of the business canvas. Make sure the participants cover all of them.

- What is your business?
- Why did you decide to invest/engage in this business?
- What are the possible benefits?
- What are the challenges you expect to face in running this business?

13. Get the groups to discuss the nature of the business related to the nine subject areas.

14. Ask the group members to identify the possible strengths and weaknesses of the business.
15. Get the group to list possible actions for upgrading. Ask them how the business model could better serve their target customers?

*Explain to the participants that the information should be entered in the format below that is also reproduced in Handout 1.3*

<table>
<thead>
<tr>
<th>BUSINESS MODEL COMPONENT</th>
<th>WEAKNESSES/THREATS TO BE REDUCED</th>
<th>STRENGTH/OPPORTUNITY TO BE BOOSTED</th>
<th>CHANGE WANTED</th>
<th>UPGRADING INTERVENTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partners</td>
<td></td>
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<tr>
<td>Key activities</td>
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<td>Value proposition</td>
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<td>Costumer relations</td>
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<tr>
<td>Channels</td>
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<td>Costumers</td>
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<tr>
<td>Cost structure</td>
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</tbody>
</table>

16. Get each group to deliver their presentation to the plenary and encourage discussion.

17. Ask the participants the following questions:

    Qu. 1: What is the likely benefit for the farmer?
    *Indicative answer: Time saving for harvesting and timely service for the farmer.*
    Qu. 2: Is there any benefit for the hire service business?
    *Indicative answer: 40% fuel cost reduction. It is cost effective for both the service provider and the farmer.*
    Qu. 3: What are the key activities needed to improve the business?
    *Indicative answer: skills development, purchase of new equipment, information on sources of finance.*
Below are a number of completed formats to give as feedbacks to the participants.

<table>
<thead>
<tr>
<th>PARTNERS</th>
<th>KEY ACTIVITIES</th>
<th>VALUE PROPOSITION</th>
<th>COSTUMER RELATIONSHIPS</th>
<th>COSTUMERS</th>
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<tbody>
<tr>
<td>- Farmers</td>
<td>- Land preparation services</td>
<td>- Low cost hire charges</td>
<td>- Reliable repair services</td>
<td>- Small farmers in maize based cropping system</td>
</tr>
<tr>
<td>- Import dealers</td>
<td>- Planting services</td>
<td>- Good timely services</td>
<td>- Trust in availability of spare parts</td>
<td>- Farmers in wheat based systems</td>
</tr>
<tr>
<td>- Manufacturers of spare parts</td>
<td>- Ripping services</td>
<td>- Keep stocks of spare parts in order to reduce down time</td>
<td>- Trustful customers</td>
<td>- Farmers groups</td>
</tr>
<tr>
<td>- Local agents</td>
<td>- Shelling and threshing</td>
<td>- Services on credit</td>
<td></td>
<td>- Farm household members</td>
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<tr>
<td>- Repair and maintenance workshops</td>
<td>- Irrigation</td>
<td>- Provide advisory services</td>
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<td>- Water user group</td>
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<td></td>
<td>- transportation</td>
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<td></td>
<td><strong>RESOURCES</strong></td>
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<tr>
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<td>- Operators</td>
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<td>- 2-wheel tractors</td>
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<td><strong>CHANNELS</strong></td>
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<tr>
<td></td>
<td>- Directly to small holder farmers</td>
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<tr>
<td></td>
<td>- To farmers through contract farming scheme</td>
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<td></td>
<td>- To farmers through groups</td>
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<td></td>
<td><strong>COST STRUCTURE</strong></td>
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<tr>
<td></td>
<td>- Transport costs</td>
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<tr>
<td></td>
<td>- Hiring of truck for transport</td>
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<tr>
<td></td>
<td>- Purchase of spare parts</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>- Storage space for machinery</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td><strong>REVENUE STREAMS</strong></td>
<td></td>
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<tr>
<td></td>
<td>- Income from irrigation</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>- Income from tillage services</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Income from shelling</td>
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</tbody>
</table>
While the supply chain development looks at the whole mechanization chain, the business model focuses on the relationship between hire service business and customers. The business model maps out your business and shows you how to increase your profits. It contains the elements and relationships that should enable you to understand the logic of your business showing you how to get more customers, improve the service and make profit while doing so. It can also be simply understood as the way to organize a business to generate revenue and make it sustainable. The business model explains the strategy of the business: it identifies the resources needed to support any activity and the costs involved in doing so; shows the channels needed between the business and its customers; helps to define how to add value for the customers.
The starting point in a business model is the value proposition. The value proposition is the key to the success of the business model. It is the reason why customers choose your service over others. The business model includes the following parts:

- **Customer segment**: it lies at the core of the business. The business is likely to serve more than one customer segment. This means that your hire service could target different customers. For example, small farmers in maize or rice based dry land farming systems, medium scale farmers involved in irrigated farming or even customers that are not involved in farming but wish to use hire services for the transport of products or people. You can serve more than one type of customer or customer segment.

- **Value proposition**: As mentioned above, the value proposition relates to the service that you provide and shows the difference between your service and others in the area. It should try to address the problems of your customers and satisfy their needs.

- **Channels**: value propositions are delivered to customers through communication, distribution and sales channels.

- **Customer relationships**: these relationships need to be set up and maintained for each group of customers (customer segment).

- **Revenue streams**: the result of the value proposition is a stream of income from customers paying for your services.

- **Key resources**: the resources that you have at your disposal to operate the business.

- **Key activities**: the actions needed to create and sustain the value proposition, maintain customer relationships, and create an income.

- **Key partnerships**: some activities are outsourced and some resources are acquired outside the business.

- **Cost structure**: the costs that the business incurs.

Flexibility and changes are an integral part of an effective business model. A too high price-quality may initiate changes that result in new, improved activities and their resource base. Businessmen should stock their resources and seek new ways to combine them. Changes in the activities may be needed at times. This can result in new services provided and an improved market position. It is important to realize that whatever the changes, they are likely to affect all parts of the business model.
**Handout 1.2. The Business Canvas**

<table>
<thead>
<tr>
<th>HOW?</th>
<th>WHAT?</th>
<th>WHO?</th>
<th>HOW MUCH?</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Partners</td>
<td>- Key activities</td>
<td>- Customer</td>
<td>- Cost structure</td>
</tr>
<tr>
<td></td>
<td>- Key resources</td>
<td>relationship</td>
<td>- Revenue streams</td>
</tr>
<tr>
<td></td>
<td>- value proposition</td>
<td>- Channels</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Customers</td>
<td></td>
</tr>
</tbody>
</table>

**Handout 1.3. Strengths and Weaknesses Format**

<table>
<thead>
<tr>
<th>BUSINESS MODEL COMPONENT</th>
<th>WEAKNESSES/THREATS TO BE REDUCED</th>
<th>STRENGTH/ OPPORTUNITY TO BE BOOSTED</th>
<th>CHANGE WANTED</th>
<th>UPGRADING INTERVENTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partners</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Key activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value proposition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costumer relations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Channels</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costumers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost structure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
This Session explores the concept of entrepreneurship, defining an entrepreneur as an innovative person working for a profit. Entrepreneurs are creative thinkers and doers who are prepared to take calculated risks in order to exploit business opportunities and make money.

This session deals with entrepreneurial competencies and it covers three exercises:

1. a panel discussion with local entrepreneurs brainstorming on the characteristics of an entrepreneur based on the panel discussion
2. a self-reflection of the entrepreneurial characteristics
3. a visit to a local entrepreneur

The sequence of these exercises are linked and will require preparation. The facilitator will need to arrange for 2-3 articulate and successful entrepreneurs to participate as panel members. Preferably they should be people with whom the participants can identify: working as service providers or in something related to agriculture such as processing, marketing, etc. Each panel member will need to be briefed as to the purpose of the panel discussion. They should each be asked to present a 5-10 minute story about themselves and the business they are managing and should be prepared to answer questions. The visit to a local entrepreneur also requires preparation.
LEARNING OBJECTIVES

• To understand what an entrepreneur is.
• To identify the characteristics of an entrepreneur.
• To understand the entrepreneurial functions of the hire service business.

KEY QUESTIONS

1. What is an entrepreneur?
2. What are the characteristics of an entrepreneur?

KEY POINTS TO COVER

⇒ Key functions of a business:
• Marketing
• Purchasing
• Operating machinery
• Controlling costs
• Controlling money
• Controlling inventories
• Managing money

⇒ Management functions
• Planning
• Organizing
• Leading
• Controlling
• Expanding

⇒ Some key characteristics of an entrepreneur are:
• Like being their own bosses (they like to control themselves instead of being controlled by others)
• Self-confidence
• Sense of urgency
• High energy
• A willingness to risk money and security
• Ability to inspire and energize others
• Strong willed
• Ability to learn from failures
• May devote a disproportionate amount of time to their business
• Very competitive
• May lack some business skills?
• A “never, never, never quit” attitude
• Honest and trustworthy
1. Before the panel discussion, brainstorm questions the participants can ask the panel. Lead the discussion to cover the questions listed below.

   **Possible questions to ask the panel:**
   - Why did they start the business?
   - How long have they been in their business?
   - How long did it take to start making profits?
   - How did they know they could make a profit?
   - What is the most important thing to do as an entrepreneur?
   - What do you need to be careful about as an entrepreneur?
   - What are the most important characteristics of an entrepreneur?
   - What about risk? Are they risk-takers?

2. Start the panel discussion by introducing the panel members.
3. Ask each panel member to tell their story.
4. Encourage the participants to ask their questions and record their answers. Organize the participants into teams to discuss some of the key functions of a business related to mechanization.
5. Discuss and agree on the management functions of the business.
6. Discuss and agree on five key characteristics of an entrepreneur.
7. Ask each team to share and explain the characteristics they agreed on.
8. Discuss which of these are the most important.
EXERCISE 2.
VISIT TO A LOCAL SUCCESSFUL BUSINESSMAN INVOLVED IN THE MECHANIZATION SECTOR

LEARNING OBJECTIVES

• To learn firsthand from a successful businessman involved in mechanization what makes a business successful
• To consolidate learning from the visit to the local entrepreneur

KEY QUESTIONS

1. What is it really like to be an entrepreneur?
2. What makes this business successful?
3. What did I learn from seeing an entrepreneur in action?

KEY POINTS TO COVER

• See an entrepreneur in action.
• Experience entrepreneurship at firsthand.
• The key things to look for and ask are:
  ➔ How the business is managed in terms of inputs
  ➔ Production and marketing
  ➔ What makes this business successful
Another way to learn about entrepreneurship is to see it in action. In this exercise, participants are first given the opportunity to visit a successful entrepreneur in his/her business place. After the visit, the participants are given an opportunity to reflect on what they have learned and to discuss how they might apply this to improve their own businesses.

The participants should be organized into teams of 4. Prior to the visit the teams should brainstorm the questions that they want to ask the entrepreneur.

During the visit, the participants ask questions and record the answers.

As a trainer you will need to arrange the visit to a number of entrepreneurs (one for each team). The entrepreneurs selected should be articulate and successful and preferably someone with whom the participants can identify who is working in something related to agricultural mechanization such as importing machinery, manufacturing, providing custom hire services and processing. The entrepreneurs will need to be informed about the purpose of the visit.
EXERCISE 3.
SELF-REFLECTION ON ENTREPRENEURIAL CHARACTERISTICS

LEARNING OBJECTIVES

- For participants to self-reflect on entrepreneurial characteristics
- To learn how to strengthen these skills

KEY QUESTIONS

1. What is it really like to be an entrepreneur?
2. What makes this business successful?
3. What did I learn from seeing an entrepreneur in action?

KEY POINTS TO COVER

- How do I rate myself as an entrepreneur?
- How can I improve my entrepreneurial skills?
Participants should be encouraged to reflect on the entrepreneurial characteristics they possess. This will enable them to make decisions about how to strengthen their entrepreneurial capacity. It is part of reflexive learning: the more they do it, the better they will become at objective self-assessment, which is critical to having a successful and profitable business.

1. Using the agreed list of characteristics, the participants should form teams of two.

2. Each team should take turns in interviewing each other. They should work through each entrepreneurial characteristic listed in the key points section of Exercise 1.

3. Each person should assess “how much” of the characteristic they have from a scale of 5 (strong) to 1 (weak) and what they need to develop. It is suggested that they use the following format to record their assessment.

<table>
<thead>
<tr>
<th>ENTREPRENEURIAL CHARACTERISTIC</th>
<th>HOW MUCH OF THIS DO I HAVE?</th>
<th>WHAT DO I NEED TO DEVELOP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>STRONG</td>
<td>WEAK</td>
</tr>
</tbody>
</table>

4. The teams should report the results back to the plenary for discussion.

5. The participants should brainstorm possible actions to take to strengthen entrepreneurial skills in general.
Entrepreneurship can be defined as the willingness to take risks and develop, organize and manage a business in a competitive market that is constantly changing. What is an entrepreneur? Entrepreneurs are determined and creative leaders, always looking for opportunities to improve and expand their businesses. An entrepreneur likes to take calculated risks and assumes responsibility for both profits and losses. An entrepreneur is passionate about growing his or her hire service business and is constantly looking for new opportunities. Entrepreneurs are also innovators. They always look for better, more efficient and more profitable ways to do things. Being innovative is an important quality for an entrepreneur, especially when the hire service business faces strong competition or operates in a rapidly changing environment.

What is evident is that successful entrepreneurs have certain characteristics in common. They usually enjoy what they are doing, they plan everything, they are careful with money, they project confidence in themselves and in their businesses, they take risks, they look for a competitive edge and are willing to change and try new ways of doing things. They are trustworthy and reliable, flexible, good negotiators, and they are always aware of what is happening around them and on the lookout for new opportunities. Not all entrepreneurs have all of these traits to the same degree. But they will have all of them to some degree. One of the best ways to identify these characteristics is meeting and talking with successful entrepreneurs.
Profit is a term used to describe the difference between the revenue or income and the costs associated with the hire service business. It is important to understand that a business must be treated differently from the household. While a household relies on the income from different sources, the profitability of the business is based on the revenue and costs related to the business and not the household. Hire service providers must also be mindful that the profitability of their business depends on the profitability of their customers. The hire services offered have to be beneficial for farmers by improving the profitability of their farms. In this session we aim to show the concept of profit and how to identify the factors that affect the profitability of a business.

**Learning Objectives**
- To understand the concept of profit
- To calculate profit
- To understand the factors that affect the profitability of a business

**Key Questions**
1. What is profit?
2. Where does profit come from?
3. What is revenue (income)?
4. What are costs?
5. What are the factors that affect profitability?
**Key Points to Cover**

- It is important to separate business profits from any household income; business must be separated from the household. A business comprises revenue and cost flows.

- Revenue is the money received from selling goods and services. Revenue is calculated by multiplying the quantity of the product or the service sold with the price of the product or service. The quantity is specified in terms of units of measurement which for a dealer would be the number of machines and implements sold and for a custom hire service the number of hectares or hours served. The price is specified in terms of a unit of measurement, i.e. $ per machine, $ per spare parts or alternatively $ per ha. or $ per hr. of operation. This is referred to as the unit price.

- Cost is the money spent to sell the products or services: the value of all the things used to produce a product or provide a service.

- Profit is the money left over from the revenue (income) after the costs are deducted. If the total revenue minus the total costs gives a negative number (that is, it is less than zero), then the business is making a loss. This means that the costs are greater than the revenues earned or the revenues are less than the costs. If the total revenue is greater than the total costs, then the calculation gives a positive number (that is if, greater than zero). This means that the business is making a profit. The larger the resulting total, the greater the profit.

- Profits are affected by:
  - Inputs (machinery, equipment, spare parts, fuel etc., being available when needed)
  - Input costs
  - Input suppliers (reliability, trustworthiness)
  - Market (location of customers, distance, accessibility)
  - Market demand (what, when and how much of the service customers want)
  - Hire charges in the local markets
  - Credit (accessibility, affordability)
  - Competitors
  - Technology (research and development)
1. Ask what is profit and why it is important. Make the participants understand that profit is the money left over from revenues after the costs are deducted.

2. Brainstorm with the participants the following questions:
   a. Where does profit come from?
   b. How do you know that you have made a profit?

3. Ask participants to define “revenue”, “costs” and “profit”. Lead the discussion to the definitions given above.

4. Ask the participants to think of things that can affect the profitability of a business they know. Keep a record of their replies and list the most common ones on the white board.

5. Encourage a discussion covering the points raised (consider capturing this in a diagram as presented in the figure p 29).

Handout 2.2. Understanding profit and profitability

A business is usually a collection of different lines of business. For example, a machinery hiring service may provide services for different operations – planting, shelling and transportation – and often service providers might offer agronomic advice for farmers. It helps businessmen to manage their whole business when they can clearly identify the different parts of their business and how each one individually affects the overall profitability of the business. While businessmen need to be able to make decisions about the whole business, they also need to make decisions about the individual lines of operation. Profitability of the business is the difference between the income generated from the different lines of the business and the costs. Each operation makes a unique contribution to the profitability of the whole business. The hire service business can make a profit as a whole even when one of its services (or lines of operation) is making a loss. It is important for owners and managers not to look at the business only as a whole but at the profitability of each service that is offered. When a business person looks at the profitability of each individual service, he or she will be able to identify which operations are profitable and which are not. Then s/he will be able to decide what to do about the unprofitable parts of the business; s/he can take steps to make it profitable, or s/he can stop providing that service.
Besides the costs of the operations, there are many other factors that affect the profitability of the business, such as the cost of providing and promoting the service or the custom hire rates of the service set. These factors are usually related to the machinery, to the inputs and materials supplied (machinery, equipment, spare parts, fuel and oil) and their subsequent costs as well as to the demand for the service, the charges set, credit availability and the level of competition in the local area. When business people become aware of how these factors affect profitability, they are able to take action to improve their businesses. An example of these factors is given below.
Costs can be divided into two categories, fixed and variable. Fixed costs do not change as you expand the utilization of your machinery and equipment. This refers to permanent labor, the leasing of land, and the maintenance of infrastructure (storage, office space etc.). Variable costs instead change when you expand the number of customers that you have with the same use of machinery. Variable costs include items such as fuel, repairs and maintenance and casual labour.

This session includes two exercises to explore the difference between fixed and variable costs and to understand the concept of depreciation.

**LEARNING OBJECTIVES**

- To understand the difference between variable and fixed costs
- To show how these costs affect the profitability of your business

**KEY QUESTIONS**

1. What are variable costs?
2. What are fixed costs?
3. How do these affect business profitability?
KEY POINTS TO COVER

• Variable costs vary as you expand your service to more customers or expand the number of hours or hectares covered through machinery hiring. They do not occur if the business has no demand for hire services. Variable costs can be allocated to specific machinery operations. Examples of variable costs include:
  ➡ The cost of fuel for machines
  ➡ The cost of labour
  ➡ The cost of repairs and maintenance

Each individual category of variable costs is calculated by multiplying the number of hours used or hectares covered with the unit cost for that operation.

• Fixed costs do not vary with changes in the number of hours or hectares covered through machinery use. They remain the same (fixed) regardless of use. Even if a machine is not used, there will still be fixed costs. Examples of fixed costs include:
  ➡ The cost of purchasing a tractor or a piece of equipment which is used for the business as a whole
  ➡ The cost of machinery and implements
  ➡ The cost of buildings (e.g. shelters, stores and office premises)

TRAINER’S GUIDE

Distribute handout 2.3. to the participants. Ask them to read the handout before the session begins.

1. Ask the participants to brainstorm what they know about variable and fixed costs. Write their ideas on the board under the appropriate headings. Lead the discussion to the definitions given in “key points to cover”.

2. Ask participants to list examples of variable costs and write them on the board. Lead the discussion to cover the variable costs listed in the points to cover. Highlight that these costs vary with the number of hours or hectares covered by mechanization and could be allocated to a particular operation within the business.

3. Ask participants to list examples of fixed costs and write them on the board. Lead the discussion to cover the fixed costs listed before. Highlight that these costs do not vary as the machinery operations change and that they cannot easily be allocated to a single part of the business.
Fixed and Variable Costs

Machinery service providers need to know how much it will cost them to use a particular machine. In some cases they may consider changing from one type of machine to an improved one, or a farmer might wish to know what the cost of using his own machine will be in comparison with the cost of custom hire work.

To calculate the operating costs of machines it is important to consider the following factors:

(a) Depreciation is related to the capital cost of the machine and covers the fall in value until the machine is either worn out, is obsolete, or is sold.

(b) Interest on capital invested in the machine.

(c) Miscellaneous charges for shelters for machinery, insurance etc.

(d) Running costs (fuel, oil etc.)

(e) Maintenance and spare parts

(f) Labour

As we discussed before these costs can be divided into fixed and variable costs.

**Fixed costs**

Fixed costs do not change with the level of services provided. These include land rental, machinery, maintaining infrastructure and permanent labour. When a machinery is bought it is a capital investment. No matter how much a machine is used, the fixed costs remain the same. Often money has to be borrowed to finance the investment and it is likely that interest will have to be paid on the loan. Even if the owner purchase the machinery with his own savings, interest will still need to be included. This will be discussed in more detail below. Any shelter or storage needed for the machinery is also included in this category like interests on capital, charges for storage of machines and insurance. Because these costs are unavoidable and do not vary with the amount of usage, they are called fixed costs. Each of these major items is elaborated on the next page.
Depreciation

Depreciation is largely a fixed amount as machines may not be used very much each year.

The hire service business has money invested in some items of farm power or machinery and as such will have to accept that the value of the investment will decline to a re-sale or scrap value at the end of its useful life (an exception to this rule is the case of draft animals which may maintain, or even increase, their value). As pointed out before, this reduction in value is known as depreciation and is represented by an annual value.

Depreciation is mostly calculated by dividing the difference between the purchase price and the resale or scrap value of the item and dividing the result by the number of years of useful life (the $ sign used in the equation simply indicates a monetary unit. It has no national significance.):

\[
\text{Annual Depreciation ($)} = \frac{\text{Purchase price ($)} - \text{Scrap value ($)}}{\text{Useful life (years)}}
\]

Interest

Interest on capital is another fixed cost item. The options for a person wishing to invest in machinery is either saving or borrowing money. In both cases there is a cost. Indeed, if a businessman uses his own savings there will be no need to pay the interest on a loan, but s/he will not be able to invest that money. The cost of borrowing is known as the interest rate. So in both cases there is a cost, although in the first case it is a lost opportunity and so is called an opportunity cost. Usually the interest rate (i) used in an annual cost calculation for machinery is the rate that would have been charged had a loan been given. This will vary with locality. Although many businessmen may manage to get loans at rates lower than the normal commercial rates, the commercial loan rate is usually used to estimate interest charges.

Interest charges are made on the average capital investment. Calculation of the annual charge assumes that the average annual capital investment is half the sum of the purchase value plus the scrap value, multiplied by i:

\[
\text{Annual interest charge $} = \frac{\text{Purchase price ($)} + \text{Scrap value ($)}}{2} \times i \text{ (%)}
\]
Other fixed costs

There may be some other fixed costs associated with machinery use, and these will need to be investigated and quantified for specific circumstances. Items can include:

- Government taxes (on tractors, for example).
- Insurance against theft or loss.
- Shelter for machinery when not in use.

Variable Costs

Variable costs are those costs which vary with the level of services provided. Variable costs vary as the service business expands to serve more customers or the number of hours served or hectares covered through machinery hiring increase. Variable costs cover things like fuel, hired labour costs, repairs and maintenance. The nature of the items will vary depending on the type of machinery used. Variable costs are not incurred if the machinery is not used. The more the machine is used the larger the variable costs. The less the machine is used, the lower the variable costs.

It is not easy to estimate the variable costs associated with machinery use. The best method is to refer to records of work performed previously by similar equipment under comparable conditions. These items will be discussed in detail below.

Maintenance and Repairs

Maintenance and repair costs of agricultural machinery fluctuate considerably from machine to machine because of different working conditions, operator skills, care for regular servicing, quality of the make and model etc. The cost of maintenance and repairs also varies according to the life of the machine. Repair costs increase with usage and are on average higher the older the machine gets. Maintenance costs include some small charges for housing and insurance, charges for repairs, spare parts and servicing.
A simple method of assessment of the repair costs is to estimate the item as a percentage of the initial cost of the machine divided by the number of hours of machine life. Estimates for different kinds of small machinery are given below.

<table>
<thead>
<tr>
<th>Tractor/ machine</th>
<th>Annual use of machine in hrs.</th>
<th>Economic life (yrs.)</th>
<th>Accum. Repair costs as % of original costs *</th>
<th>Accum. Repair costs ($)</th>
<th>Accum. Use (hrs.)</th>
<th>Av. repair costs/ hr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tractor 15 hp</td>
<td>800</td>
<td>5</td>
<td>35</td>
<td>875</td>
<td>4000</td>
<td>0.22</td>
</tr>
<tr>
<td>Trailer</td>
<td>1,440</td>
<td>10</td>
<td>20</td>
<td>170</td>
<td>14,400</td>
<td>0.01</td>
</tr>
<tr>
<td>VMP</td>
<td>571</td>
<td>7</td>
<td>30</td>
<td>1050</td>
<td>4000</td>
<td>0.26</td>
</tr>
<tr>
<td>Fitarelli double row</td>
<td>400</td>
<td>10</td>
<td>30</td>
<td>1440</td>
<td>4000</td>
<td>0.36</td>
</tr>
<tr>
<td>Fitarelli single row</td>
<td>400</td>
<td>10</td>
<td>30</td>
<td>450</td>
<td>4000</td>
<td>0.11</td>
</tr>
<tr>
<td>2BFG seeder</td>
<td>800</td>
<td>5</td>
<td>30</td>
<td>277.5</td>
<td>4000</td>
<td>0.69</td>
</tr>
<tr>
<td>Morrison seeder</td>
<td>500</td>
<td>8</td>
<td>30</td>
<td>930</td>
<td>4000</td>
<td>0.23</td>
</tr>
<tr>
<td>Chopper, sheller, thresher</td>
<td>571</td>
<td>7</td>
<td>50</td>
<td>1500</td>
<td>4000</td>
<td>0.38</td>
</tr>
<tr>
<td>Water pump (5 hp, Chinese)</td>
<td>1333</td>
<td>7</td>
<td>50</td>
<td>250</td>
<td>9333</td>
<td>0.03</td>
</tr>
<tr>
<td>Disc plough</td>
<td>1333</td>
<td>3</td>
<td>30</td>
<td>90</td>
<td>4000</td>
<td>0.02</td>
</tr>
</tbody>
</table>

For instance the repair cost of a 2WT is assessed as 35% of the initial cost. The life of the implement is 5 years or 4,000 hours (800hrs. x 5 years). This method allows us to calculate the repair cost per hour which increases with tractor use. As is well known, the wear on cultivation implements depends to a great extent on soil conditions and some adjustment may need to be made to take into account extreme variations in conditions.
**Fuel**

The cost of fuel is simply calculated on the basis of the number of litres used per h.p. of operation. For diesel engine tractors the standard rate is 0.12 litres per hour/ h.p. and for an average 14 h.p. machine it is 0.2 litres per hour. This figure would be multiplied by the cost of diesel fuel per litre in order to get the total fuel costs per hour. Lubricants are charged at around 6% of the cost of fuel.

Finally, the cost of the tractor driver per work hour is added to this figure.

The table on the right shows an example of how the hourly costs could be estimated for a 2-wheel tractor.

---

**BOX 1: ESTIMATION OF THE COSTS OF OPERATING A 2-WHEEL (15 HP) TRACTOR**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Calculation</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ANNUAL FIXED COSTS:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depreciation</td>
<td>(Purchase price - Residual value) / Useful life</td>
<td>(2,500 - 250) / 5</td>
<td>$450</td>
</tr>
<tr>
<td>Interest</td>
<td>((Purchase price + Residual value) / 2) x Interest rate</td>
<td>(2,500 + 250) / 2 x 0.15</td>
<td>$206.25</td>
</tr>
<tr>
<td><strong>Sub-total:</strong></td>
<td></td>
<td></td>
<td>$656.25</td>
</tr>
<tr>
<td><strong>ANNUAL VARIABLE COSTS:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repairs and maintenance/ hr.</td>
<td>(Repair and spares rate x Purchase price) / Hours</td>
<td>(0.35 x 2,500) / 4,000</td>
<td>$0.22</td>
</tr>
<tr>
<td>Fuel</td>
<td>($Fuel rate per litre x Fuel use) / Hours</td>
<td>($1.4 x 1.68) / hour</td>
<td>$1.44</td>
</tr>
<tr>
<td>Labour</td>
<td>($Labour rate per day / Hours)</td>
<td>($6.25 / day) / hour</td>
<td>$1.42</td>
</tr>
<tr>
<td><strong>Sub-total:</strong></td>
<td></td>
<td></td>
<td>$3.08</td>
</tr>
<tr>
<td><strong>Total Hourly Costs</strong></td>
<td></td>
<td></td>
<td>$3.91</td>
</tr>
</tbody>
</table>

**Hourly Fixed Costs**

$8.31

**Hourly Variable Costs**

$3.08

**Total Hourly Costs**

$3.91

Repair and spares estimated at 35% of purchase price over the useful life of the tractor.

Fuel use: 1.8 litres/ hr.
Depreciation is the word used to describe the reducing value of an asset like a tractor or implement over time: each year the value of a piece of equipment goes down. Although it does not cost cash, each year a little bit of the value of the equipment is used up and the used up value is a cost to your business. It is usually a fixed cost because some of the equipment may be used for more than a single hire operation.

**Key Questions**

1. What is depreciation?
2. How can depreciation be calculated?

**Learning Objective**

- To understand the concept of depreciation and how to calculate it.
**KEY POINTS TO COVER**

- Many farm machines may not be used very much each year so depreciation is not influenced by the actual annual usage. Thus, it should be regarded as a fixed cost.
- The value of the machinery declines over time even if it’s not used.
- At the end of its life the machinery has a scrap value.
- The reduction in value is what is known as depreciation and this can be estimated on an annual basis.
- Depreciation can be calculated by dividing the difference between the purchase price and the resale or scrap value of the machinery and dividing the result by the number of years of useful life:

\[
\text{Annual depreciation ($)} = \frac{\text{Purchase price ($)} - \text{Scrap value ($)}}{\text{Useful life (years)}}
\]
1. Remind participants that we previously discussed the concept of fixed costs. We mentioned that, differently from variable costs, fixed costs apply to the business as a whole. Fixed costs are costs that do not vary with changes in the volume of output of the hire service. Fixed costs remain the same, regardless of the level of the output.

2. Ask participants to list examples of fixed costs and write them on the board. Lead the discussion to include at least the following fixed costs:
   • The cost of purchasing a tractor or a piece of equipment
   • The cost of business infrastructures (e.g. a shed)
   • The cost of permanent labour and management
   • Depreciation

3. Ask the participants if any of them owns a tractor, a planter or some other implement. Ask whoever answers if that piece of equipment can last forever. Does it ever wear out? **The response should be that it does not last forever and it eventually wears out.** How long have you used it? How often do you replace it?

4. Explain that every piece of equipment has a money value. Its highest value is usually when it is new. Its lowest value when it is old. It has no value when it no longer works or does its job.

5. Point out that calculating depreciation allows you to measure the annual cost of the equipment.
6. Mention to the participants that to calculate depreciation you need to know two things. First, you need to know the price of the equipment when you first bought it. Second, you need to know how long the equipment will last.

7. Draw the following diagram on the board: Explain the following with the help of the board. Let us say that we have a new planter (seeder). The price when it was new was $100. We know the planter will last 10 years. In the diagram we see 10 slices in the pie. Each slice represents one year of life of the planter. Simple depreciation says that each year the value of the planter reduces by 10% of the original value. In this case it is $10 per year. We will therefore subtract $10 from the value of the planter each year for 10 years. At the end of the 10th year, the planter will be fully depreciated. Its value is now zero (0). As you are explaining this, add -$10 next to each year in the diagram.

8. Explain that depreciation is the annual cost or value of a fixed asset that will be used when calculating the profit of the business.

9. Conclude this meeting by summarizing key points for discussion.
Hire service providers take decisions in a risky and ever-changing environment that makes them unsure about the outcome of their decisions. Even though it is impossible to prevent changes and avoid risks it is useful for the owner/managers to know their sources and learn strategies to mitigate them.

**LEARNING OBJECTIVE**

- To understand how risks can affect a business and how they can be managed.

**KEY QUESTIONS**

1. What is risk?
2. How does risk affect a business?
3. How is risk managed?
Key Points to Cover

- Risk refers to things that can happen and harm the business.
- Risks have a direct impact on the hire service business and the options to increase profitability and income. Good management includes making decisions to reduce vulnerability to risk.
- Risk can be classified in the following way:
  - Production and technical risks
  - Marketing or price risk
  - Financial risk
  - Institutional risk
  - Human or personal risk
- The different types of risk often need to be considered together.
- Risk balancing is fundamental to risk management for most businessmen.
- Businessmen usually have to balance maximizing profits and minimizing risks.
- Businessmen need to think about potential risks ahead of time and be prepared for them.
- Risk-reducing strategies include:
  - Offering low risk services
  - Diversifying by expanding the range of businesses
  - Offering hire services to different farmers in different agro-ecological zones
  - Selecting and changing production practices
  - Maintaining flexibility
  - Maintaining reserves
  - Acquiring assets
  - Insuring against losses
  - Phasing service operations throughout the year
  - Maintaining resources
  - Pacing Investments
This exercise is linked to the concept of the Business Model – Session 1. In order to conduct the exercise, the participants should be introduced to the Business Model and have had experience in conducting the exercise in the earlier session. Distribute Handout 2.5. to the participants before the session and ask them to review it before the session begins.

1. Conduct a plenary brainstorming session around the question of what is risk?
   Explain that risk is defined as any factor that may cause losses to the business.

2. Ask participants what kinds of risks they face in their hire service business. List the responses of participants on a flip chart/board.
   If necessary, prompt the participants by mentioning the following possible risks:
   - weather conditions change
   - cost of equipment and spare parts could increase rapidly
   - labour for hire service operation may not be available when needed.
   - machinery and equipment could break down when most needed
   - power sources may be cut
   - Government policy can change overnight

3. Ask participants if the risk in their business has reduced or increased over time. Tell the participants that the risks can be divided into two types: those which are external (changes in market prices, low rainfall, etc.), and those which are internal (unavailability of cash, machinery breakdown, and unavailability of labor). Effective entrepreneurs learn how to ‘manage’ both types of risks.

4. Develop the concept further. Ask the participants the following questions:
   - What factors could affect the profitability of the business?
   - What factors could impact on the technological aspects of the business?
   - What factors can impact on the marketing and promotional part of the business?
   - What could happen to the financial parts of the business?
   - What could happen to the human part of the business?
5. Tell the participants that a systematic way to look at risks is to link the risks to the elements of the business model:
   • Customer segments: ...
   • Value propositions: ...
   • Channels: ...
   • Customer relationships: ...
   • Revenue streams: ...
   • Key resources: ...
   • Key activities: ...
   • Key partnerships: ...
   • Cost structure: ...

6. Show the participants the business model and give an example of risks for each element.

7. Tell the participants that you would now like them to explore risks in more detail. For this, you will divide them into groups.

8. Ask each group to note the risks associated with the business model elements. After 30-45 minutes, invite the groups back to the plenary. Have a member of each group make a presentation, and facilitate discussion.

9. Ask the participants to develop a table along the following lines:

<table>
<thead>
<tr>
<th>RISK</th>
<th>WHAT HARM IT CAN DO</th>
<th>HOW TO HANDLE THE RISK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. Ask the participants to think about their businesses. Ask them to break into groups to discuss the specific risks that they might face in their businesses (see list above).

11. For each risk they should identify what harm it can do, and how to handle the risk (see example).

12. Encourage discussion. Have they covered all the risks? Are the strategies to address these risks likely to work?
**Handout 2.5. Understanding Risk in Business**

**What is risk?**

Hire service providers are particularly exposed to uncertainties of weather, prices and diseases. Many farmers live on the edge of extreme insecurity, sometimes falling just below, and sometimes rising just above the threshold of survival. Farmers do not know whether rainfall will be good or bad over the season. They do not know if the crop will be infected by disease. These are risks that impact the hire service business. Variations in rainfall can affect the timing of machinery operations in land preparation and tillage. Price variations can impact the income of farmers and this in turn can affect the demand for custom hire services. The risks that farmers face affect the risks of the hire business.

Business risks for hire service suppliers imply uncertainty in profits or danger of loss. Business risks reflect the possibility of lower profits and even losses due to uncertainties, e.g. changes in customers' tastes, increased competition, change in government policy, climate variations, obsolescence of machinery etc. Although many of the risks are usually not under the control of the service providers themselves, they still need to develop strategies to cope with them.

**Types of risk**

Risks have a direct impact on the hire service business and the possibility to increase profitability and income. Risk can be classified in the following way:

*Production and technical risks:*
Crop and livestock performance are affected by weather, soils, pests and diseases. These cannot be predicted accurately. Farmers experience a wide range of weather conditions. Poor rainfall leads to untimely land preparation and sowing and this in turn can result in low plant growth and yields. These factors affect the demand for planting, shelling and threshing services as well as transportation of final produce. Pests or diseases can also cause major yield losses which can impact deleteriously on the hire service business. From the perspective of the hire service business there are also risks involved in providing services and operating the machinery business; scheduling may fail as a result of climate variations and changes in the demand for services.
Marketing or price risk:
At farm level the prices of farm products may vary from year to year or even on a daily basis. These changes are usually beyond the control of the individual farmer. This in turn can result in a drop in demand for mechanization services. Demand for a machinery service is affected by the level of income of its customers, the strength of the general economy and the supply of competing services. While the costs of machinery and implements do not usually change suddenly, they generally increase steadily year to year. However, some inputs such as petrol and diesel are subject to sudden price increases.

Financial risk:
Financial risk occurs when businessmen borrow money to cover their business needs. Risk may be caused by uncertainty about the interest rates lenders charge and their willingness to continue lending. On the other hand, financial risk is affected by the ability of the business to generate the cash flow necessary for debt payments.

Institutional risk:
Institutions include organizations and businesses on which the hire service business relies for machinery and equipment, inputs and materials, markets, information, finance, etc. Unpredictable changes in the provision of services such as the supply of credit, purchased machinery and inputs and information from institutions are also risks faced by businesses.

Human or Personal risk:
Human risk refers to problems of health and personal relationships that affect the business. Illness and death threaten and disrupt the performance of the business through reduced productivity of labour.

Production, marketing, financial, institutional and personal risks impact on all hire service businesses and are often interrelated. The ability to repay debts depends on the volume of services offered and the custom hiring charges set. Financing of the business depends on the ability to borrow capital and the performance of the institution to supply capital in time. The different types of risk often need to be considered together. Risk balancing is fundamental to risk management for most businessmen. Because of the multiple sources of risk, comprehensive strategies that integrate several responses to variability are often necessary for effective risk management.

Risks influence both the income expected from the business and the level of expenses. As a result profits are always uncertain. But not all of these factors have the same effect on the business. Businessmen have to balance between maximizing profits and minimizing risks.
Competition is a key part of the business environment. Competitive advantage is vital to ensure sustainability of the business model over time.

LEARNING OBJECTIVES

• To understand how competition can affect the hire service business
• To identify possible competitors and improve

KEY QUESTIONS

1. What is competition?
2. How does competition affect your business?
3. How can you understand who your competitors are?
4. What do you need to do to become an effective competitor?
KEY POINTS TO COVER

• Competition is an important part of a business environment.
• Competitive advantage is what keeps a business model strong over time and competitors at a distance.
• Competitive advantage is necessary for a business to have long-term power.
• Businessmen need to think about their competition ahead of time and be prepared for them.
• Understanding possible competitors should be part of any marketing strategy.
• Competitive intelligence can be gathered by:
  ➡ Asking customers.
  ➡ Visiting your competitors’ customers.
  ➡ Talking directly to competitors.
  ➡ Speaking to staff working for your competitors.
  ➡ Networking with friends and family members.
1. Plenary brainstorming around the following questions:
   • Why are competitors important? How can an owner/manager learn from competitors?
   • What kind of questions can you ask to better understand your competitive advantage?

The discussion should lead to understand competition and learn how to find out more about competitors

2. Ask the participants to think about their businesses: can they give examples of competitors in their business sector? What are the implications for their business?

3. Ask them whether they feel competition is good or bad for their business? What are the risks of competition? Why are competitors important? How can a business owner learn from his/her own competitors?

4. Divide the participants into two groups. Each group should decide on a product or service preferably related to mechanization. The groups should brainstorm answers to the following questions:
   • How does competition affect your business?
   • What can you do to effectively compete?

5. Ask the groups how they can find out more about their competitors. Have them list the questions needed to better understand competitive advantage. Give examples from the list below.
   • With whom are you competing?
   • Do you possess any competitive advantage in terms of costs, differentiation, or access to resources?
   • How significant is your competitive advantage?
   • Will you be able to maintain or grow your competitive advantage in the near future?
   • Is there a significant threat from new competitors entering the market?
   • Are the numbers of your competitors increasing or decreasing?
   • Is the bargaining power of your suppliers increasing or decreasing?
   • Is the bargaining power of your customers increasing or decreasing?
   • What are the factors that might prevent you from entering a particular market?
6. Ask the participants what a business owner should do if selling a service becomes difficult because of competition? Use the list below as possible strategies:
   - Lowering prices
   - Altering the product or stocking a different product as a substitute
   - Providing improved services to customers
   - Using sales promotion techniques

7. Get each group to report back their findings. Encourage discussion. Have they covered all aspects? What can they do to deal with competition?

8. Complete the session by noting that a business person should always know all about what his/her competitors are doing – not just the custom hire rates they are charging. Point out that higher rates may mean lower demand for services and lower profits; lower rates may mean higher demands and thus higher profits (but they could also mean lower profits). Ask what they think is more likely to happen. Point out that it is easy to lower prices but it can also be risky. Why? Ask if they agree with the following statement: “A successful business competes by offering more services for the same price, not the same services for a lower price”. Encourage discussion.
**Handout 2.6. Understanding Competition**

Competition is an important part of your business environment. Competitive advantage is what keeps the business model strong over time and competitors at a distance. In order to have a solid and durable business model you must always work on having some form of meaningful competitive advantage. Without it, your business will not have long-term staying power. Competitive advantage is the sum of all the aspects of the business model that your competitors wish they could copy, but can’t.

You need to understand your competitors and this should be part of your marketing strategy. By understanding the strength of your competitors you can learn to improve your business. Competitors are also an important source of information. You can learn a lot by understanding where your competitors get their supplies; what discounts do they give and get; what services do they offer to their customers; if they sell more and why; what gaps are there in the services presently offered.

New competitors can enter the market at any time. This is especially true if you have identified a lucrative or underserved market where competitors can easily enter.

How can you gather competitive intelligence? Here are some hints:

- Ask your customers: they are your eyes and ears.
- Visit your competitors’ customers. Find out what their perceptions and preferences are about the products and services they receive.
- Talk directly to your competitors. Some competitors may not see you as a threat and give you information.
- Contact staff working for your competitors (drivers, guards, operators).
- Network with friends and family members.
Custom hiring is a way of spreading the fixed costs of machinery over a larger area and thereby reducing the costs per unit charged to smallholder farmers. Determining the rate to charge for machinery services is vital to ensure profits are made. Setting hiring charges, however, can be difficult for service providers due to the wide range of machinery items on the market and the knowledge needed to ensure that all costs are covered in the calculation. This session will discuss these issues in detail.

**LEARNING OBJECTIVES**

- To understand the cost items involved in machinery operations
- To learn how to calculate these costs
- To understand how hiring charges can be set

**KEY QUESTION**

1. How can we set hiring charges for different machineries?
KEY POINTS TO COVER

- Custom hire charges are complex to calculate and need to be based on actual data collected in records.
- Most service providers and farmers don’t keep records, so when computing cost of hiring they rely on some standard information provided by research.
- More intuitively, service providers assess their hiring charges on the basis of the rates found in the market.
- Very often the market rates may not directly match the service provided so the rates often have to be adapted for small scale mechanization.
- Custom hire charges are often not an accurate reflection of the actual costs involved.
- Precise calculation can be made by taking the total costs both fixed and variable and bringing them to a common base of time (hrs.), area of land (ha.) and produce processed (tons), depending on the operation.
- Margins will need to be added to the actual costs, to account for the return to management and labor.
1. Ask the participants if they are familiar with the custom hire rates in their locations. Ask them how custom hirers set their hiring charges for the services offered in their local context. Prompt them into providing the following information:
   - Checking the prices of competitors in the business
   - Calculating the costs of their services

2. Ask the participants if they have ever used machinery or draft animal contractors and if so, for what operations.

3. List these operations on the board and ask them if they remember the hiring rate and write them on the board next to the respective operation. Ask the following questions:
   - How do they think the rates are set?
   - Is this a precise way to calculate the rates?
   - What are possible flaws?

4. Ask the participants how they would set their rates for hiring services.

5. Ask what cost items should be included. Should charges be set per day/hour/hectare and should they be standardized for all operations or vary for each?

**Note to the trainer:**
Some of the participants are likely to set them pegged to contracting charges. Point out that the contract rates may be for 4WTs or draft oxen.
6. If they set their rates according to existing contracting charges, ask them how these rates can be adapted for a 2WTs? Initiate a discussion.

7. Ask the participants how they could set their rates with information collected on the operating costs of different machineries. What would they include as fixed and variable costs? Lead a discussion.

8. Provide the following example:

**Fixed costs**
- Cost of the machinery
- Annual depreciation
- Interest
- Insurance and road license
- Storage cost

**Variable costs**
- Labour
- Fuel and lubricants
- Spare parts

Clarify that these are the only items that need to be covered. Ask the participants if they can estimate these costs.

9. Ask the participants how this information can be brought to an hourly or hectare basis? Provide the following example:

- Total annual fixed costs = $2,826
- Total variable costs = $715
- No. of hours of operation = $240
- Fixed costs per hr. = $11.8
- Variable costs per hr. = $2.98
- Total costs per hr. = $14.8
10. Ask the participants if charges should be set per day/hour/hectare and whether they should be standardized for all operations or vary for each. Encourage a discussion.

11. Ask the participants if this procedure takes into account their return to management and if they know the kind of margin that service providers charge. Explain that if they are too greedy and their prices are too expensive, their customers may not be able to pay them and somebody else could charge a lower price.

12. Conclude by summarizing the main points from the discussion:
   - Custom hire charges are complex to calculate and need to be based on actual data collected in records.
   - Most service providers and farmers don’t keep records so computation could be based on standards collected from other sources.
   - Alternatively, some service providers assess their hiring charges on the basis of market rates for hire services which often need to be adapted for the 2WT machinery.
   - Hiring rates are often not a good representation of the actual costs involved. They can be lower or higher than actual machinery costs.
   - Precise calculation can be made by taking the total costs both fixed and variable and bringing them to a common base of time (hrs.) or area of land (ha.) served.
   - A margin needs to be added to the actual costs in order to account for the return to management and labor.
Handout 3.1. Setting Hiring Charges

The range of hire services that can be offered is wide and each of them has a potential to make a profit. However, all of these services have costs which need to be estimated. Service providers need to know their actual costs of operations. Farmers who are considering buying machinery need to compare the costs of owning their own machines with the costs of custom hiring. Cost calculations are also required for machinery hire service providers to understand the costs involved and set their hiring charges. This type of calculation is a little complex and may require the collection of data recorded over time. Many farmers and businesses may not have the data and will have to rely on standards produced by research organizations. We will discuss the method of computation later. However, as a starting point, service providers or farmers providing services to neighbors tend to peg their hiring rates on custom hire rates found on the market.

A key calculation is the work rate for various items of machinery: that is the number of hours per hectare or hectares per hour that a machine will need to conduct a farm operation. This consequently varies depending on the travel speed of the machine and the load that it pulls: work rates are calculated based upon the implement’s working width and its travel speed. However, in all field operations there is a difference between the basic work rate and the actual work rate. This is referred to as field efficiency. Field efficiency can vary greatly depending upon work conditions (field size and topography, soil or crop conditions, suitability of the equipment for the task, and availability of support equipment.

Custom hire rates

In countries where a market for mechanization services exists, market rates can be found from conducting an assessment of hire charges in the rural area. In Sub Saharan Africa, 2WT mechanization is a new technology and the market tends to be undeveloped. A market, however, is likely to exist for 4WTs and/ or draft oxen and this is sometimes used as a base for pegging the 2WT rates.

Examples of hiring rates in Zimbabwe ($1/ bag for maize; max distance of 5-6 km; $20 to transport groceries – 6km):
- Water lifting $15/ 3 hrs. = 1 ha. (5 liters of diesel for 1 ha)
- Ploughing $30/ 3 hrs. = 1 ac.
- Shelling/ threshing $2/ shelled bag (20 bags per ton) = $10/ton.
- Grinding/ milling $0.5/ 20-liter bucket $0.5 per 20 kg.
- Transport $30/1000 bricks
The rates given were pegged to the rate of 4WT with some modification related to the difference in power use. The hiring rates of machinery vary according to the type of machine and accessories, the size of the power source and the demand for a particular implement.

Whilst this is a quick and easy way of setting hiring charges, it is also dirty. Too often custom rates do not represent the full cost of the machinery for the owner. This may occur if the owners are not familiar with the operational costs items and especially if they don't keep records. Moreover, if a machine was purchased a long time ago its cost may be treated as sunk cost. These costs occur whether or not the business performs additional operations. If a service provider offers custom operations to farmers, the fixed costs are spread over a larger area, thus reducing the costs per unit. So, operations could have different values depending on the volume of work on offer as well as the timing. A service provider might “have time” to perform custom activities only before or after the optimal time for such operations, meaning that such activities are likely to be valued less than optimally timed operations. Farmers may demand services at a lower rate than the optimal one. If such ill-timed activities dominate, then neighbor to-neighbor custom work will be often performed below the full cost of owning and operating the machinery.

Custom rates may also be set at lower levels than the total cost of ownership and operations when the quality of the operation is likely to require less control and precision. When a customer takes decisions regarding the timing of operations and the calibration of the machines (depth of planting, tillage, etc.), less management and operational control are required. Another reason why custom rates may be lower than actual machinery costs is because businesses specializing in custom operations are likely to have lower costs on a per unit basis. This is because they use the equipment – often specialized for a specific operation – more intensively (i.e., cover a larger area per year) than most farmers, thus reducing the fixed costs per hectare. Additionally, custom operators may be able to purchase machinery at a lower cost than most farmers due to volume discounts. Finally, in some instances, a farmer might not charge friends, family, and neighbors the full cost to perform an operation as a reciprocal gesture.

Alternatively, the custom hire rates may be set at a too high a level. This depends largely on the margin that the machinery owner sets. In some situations, service providers may set margins in excess of 150%. The success of this strategy depends on how developed the market is for that machinery, that is on the willingness of the customer to pay.
Calculating hiring charges

The first step in determining appropriate hiring charges is to define the machinery cost. The following is a brief discussion of each of the costs.

**Fixed costs**
- Cost of the machinery
- Depreciation
- Interest charges
- Insurance and road license
- Storage costs

**Variable costs**
- Labour
- Fuel and lubricants
- Spare parts

The cost of the machinery is its purchase price. Machinery repairs consist on the expenses for replacement parts due to age, wear, or accident. Fuel and oil expenses are simply the fuel and lubrication expenditures. Transport expenses include depreciation, fuel, oil, and repairs. Shelter costs are the costs of storing machinery. Machinery labor cost covers the time dedicated to machinery operation, maintenance, repairs, and management. Depreciation is another cost item that needs to be included.

Once the fixed and variable costs are estimated, they will have to be brought to a common basis in order to calculate the hiring charge costs. This could be hectares or hours of use. In this example we take hours as the base. We need the number of hours for each operation to bring all of these costs down to a base of hours per hectare. The number of hours available for field operations reflects the timing of seasonal operations. Costs can be calculated on a per hour basis by simply dividing the fixed and variable costs by the number of work hours for this operation.
An example

This is an example for a seeder/planter:

As the seeder is not self-propelled any calculation needs to include the 2WT, the seeder and a trailer to transport it:

- Purchase price of 2WT – $2,500
- Purchase price of seeder - $3,500
- Purchase price of trailer - $2,500
- Total value = $8,500
- The life of the machine = 5 years
- Selling price = $850

The average value of the machine package is calculated as the average of $8,500 + $850/2 = $4,675

Calculating fixed costs

Depreciation: This is calculated as the difference between the purchase price of the machinery and the selling price after 5 years, divided by the average life of the machine (in years):

- Purchase price - $8,500
- Selling price - $850
- Life – 5 years
- $8,500 – 850 = $7,650 / 5 yrs. = $1,530

Interest on capital - This is the interest on the money tied up in the machines that could have been invested in the bank at this interest rate. Here we are assuming a 25 percent interest rate. So the average value of the capital $4,675 is multiplied by 15% interest = $701

Storage - Unless the machinery is kept in the open, then storing the machinery in a shed incurs a cost. Storage costs are usually calculated at a rate of 2% of the purchase price. In this example this would be $8,500 x 2% = $170.

Adding all the fixed costs gives a total of $2,401: $1,530 annual depreciation + $701 interest + $170 storage cost = $2,401
Calculating variable costs

These items include labour, fuel, spares and repairs.

Labour: Labour is needed to operate the machines and the rate can vary depending on the availability and the individual’s experience and skills. In this example, it is assumed to be $75 per month.

Fuel: Fuel cost is dependent on fuel market price and can fluctuate dramatically. The load (per cent of available power being used) and duty cycle (per cent of time at particular loads) will affect the cost. To determine the cost based on fuel efficiency, 75 per cent load is assumed. The selection of the power unit and the operating conditions (yield, moisture, soil type, terrain etc.) will also affect fuel use. This means that for similar tasks there can be a wide variation in fuel cost.

Fuel cost can be calculated by estimating the number of litres of fuel used and the cost of fuel. For the number of litres used we need to estimate the fuel use per hectare or per hour. If we take the fuel use per hectare as 15.4 litres this could be converted into hours by dividing it by the work rate (in hours per ha.). In this case the work rate for planting is 9.7 hours per ha. This results in a utilization rate of 1.58 litres per hour. The cost of buying fuel is $1.25 per litre. The cost of fuel per hour is then calculated by multiplying the fuel use with the cost per litre. In this example the cost = $1.98 per hour.

Spares and repairs: Each machine’s optimal life is typically measured in hours. Routine maintenance such as oil, lubricants and filters, as well as component wear or damage is associated with hours of use regardless of when they occur over its life. In the early life of a machine repairs due to component failure are not usually as high as later. However, during its life repair expenses will occur. One way that repairs and maintenance can be calculated is by using standard data collected by experts. The data required are

- Annual use of machines (a)
- Economic life of machines (b)
- Accumulated use of the machines in hours (c)

The accumulated life of the machine is calculated by (a x b). From standard data the accumulated repair costs are computed as a percentage of the original cost of the machinery. This varies depending on the type of machinery and implement. These are some examples:
Repair costs are calculated according to this breakdown:
(a) Cost of machine = $2,500
(b) Accumulated repair costs as % of original = 35%
(c) Accumulated repair costs = a x b / 100 = $875

All of this information needs to be brought to a common base of hectares or hours of use in order to calculate the hiring charge costs. The number of hours for each operation is needed. In this example 240 hours of work over the season is assumed. These costs can be calculated on a per hour basis by simply dividing the fixed and variable costs by the number of hours work for this operation i.e. 240 hours. An example is given below:

Total annual fixed costs = $2,826; Total variable costs = $715; No. of hours of operation = 240; Fixed costs per hr. = $11.8; Variable costs per hr. = $2.98; Total costs per hr. = $14.8

If the cost of the service provider is $14.8 per hour, s/he has to charge this price just to cover the costs of doing one hour of planting. Whilst this calculation takes into account the actual costs of operation, mechanization hiring service providers need to add a margin for profit and management. Service providers do not want to work for free and they know that making money above their costs will also enable them to have money to maintain their machinery regularly, repair them if the needs arises and possibly have money to save. They should also know that they have to get their “salary” for doing this job. Service providers need to make a profit. If the price is too expensive, the customers may not be able to pay them and competitors could charge a lower price and take the work from them. In this example a mark-up of 20 percent is a fair price and is likely to be acceptable to customers.

So with this calculation:
14.8 x 20 / 100 = $2.96
The service provider will charge a profit of $2.92 per hour; and this will make the final price $17.8 ($14.8 + $2.96).
Break-even analysis is an analysis to determine the point at which cost and income are equal and there is neither profit nor loss, that is the level of output or sales at which the revenue received by the business is exactly equal to the cost of making (or selling) that output. The break-even point looks at a financial result reflecting neither profit nor loss.

**Learning Objective**

- To calculate the break-even point to find out when exactly sales revenue just covers total cost i.e. fixed and variable costs combined

**Key Questions**

1. What is the minimum number of hours or hectares needed to ensure that the field operations are profitable?
Key Points to Cover

- The break-even rate is the minimum level of operations that are needed to cover the costs of service provision.
- The break-even calculation is made by dividing the annual fixed costs by the difference between the custom hire rate per unit (hr./ha.) and the variable costs of operations per unit (hr./ha.). See the example below.

\[
\text{Break-Even Point} = \frac{\text{Total annual fixed costs of machinery}}{\text{Custom hire rate per hr.} - \text{variable costs per hr.}}
\]
1. Explain to the participants what a break-even point is.
2. Ask the participants how they would calculate it. Explain that they would need data on fixed costs, variable costs, and charge rates. Get the participants to refer back to previous sessions where custom hire rates were set. Mention that this is the income flow.
3. Explain to the participants how the break-even point is calculated using the following data as an example:
   - Annual fixed costs = $1,134
   - Custom hire per ha. = $30
   - Variable costs per ha. = $20
   - BEP = 1134/ 30-20 = 113 hectares
4. Get the participants to visualize the calculation using the figure below:

   The data needed to calculate the break-even point are: annual fixed costs = $1,134; custom hire per ha. = $30; variable costs per ha. = $20

5. Explain that - based on these figures - if you have less than 113 hectares it is better not to buy the planter.
6. Refer the participants to Handout 3.2. for a detailed explanation of the break-even point.
Break-even analysis is a technique for studying the relationship between costs and income at different levels of mechanized operations. In the context of the hire service business the break-even point looks at the level of the service where total revenues equal total costs, i.e. the point where no profit (margin) is made.

In preparing a break-even budget the values of all the variables except one are known. For example, a hire service provider might be interested in substituting one hire operation with another depending on the break-even point calculation. In this situation the breakeven budget is constructed to estimate the minimum area that would have to be serviced to make the change worthwhile. If the expected costs and revenues are known but the demand for the service is not, the budget could indicate the minimum area that must be served to make the change worthwhile for the business.

A break-even analysis is illustrated by the following examples:

Example 1. Break-even point for a Hire Service Provider to decide whether or not to buy a 2WT and a seeder.

As a service provider you will have to decide whether it is worthwhile for you to undertake a farm operation. If you only have a small number of customers and only need to use a piece of machinery for a few hours a year, providing the service may not be viable. To decide whether it is worthwhile to invest in the service, you need to work out the cost of owning and operating the machinery.

Suppose you are a service provider who has to decide whether or not to buy a 2WT and a seeder to broaden your range of services. In the Table on the next page the Service Provider has set his custom hire rate at $29/ ha. and has estimated his demand to cover 35 hectares of operations. The hire rate was calculated in the same way as we discussed in the session on setting hire charges. The annual cost of the machinery is divided into fixed and variable costs.
The break-even point is calculated by dividing the annual fixed costs of the 2WT and the seeder by the difference between the hire charge per hectare and the variable costs per hectare. The equation can be represented like this:

\[
(BEP)_i = \frac{\text{Fixed Costs in $ /year}}{((\text{Hiring Cost/ha})_i - (\text{Variable cost})_i ($ /ha))}
\]

This can be elaborated as:

- **Depreciation + interest + insurance**
- Contractor charge/ ha. – 2WT and seeder variable costs/ ha.

\[
\frac{472.0}{29 - 5.4} = 20 \text{ ha}
\]

Total variable cost = 190
Hectares of operation = 35
Variable Cost/ha. = 5.4

The minimum area of maize needed to justify the purchase of the 2WT and the seeder is 20 hectares.

Based on these figures, if the Service Provider has less than 20 hectares it is better not to buy the set of machinery and equipment. The hire service owner will have then to assess the likely demand for the machinery.

### PARTIAL BUDGET

<table>
<thead>
<tr>
<th>Cost of change</th>
<th>Benefits of change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income foregone</td>
<td>$</td>
</tr>
<tr>
<td>No change</td>
<td>0.0</td>
</tr>
<tr>
<td>New costs</td>
<td>Costs avoided</td>
</tr>
<tr>
<td>Fixed costs</td>
<td></td>
</tr>
<tr>
<td>Depreciation</td>
<td>250</td>
</tr>
<tr>
<td>Interest</td>
<td>22</td>
</tr>
<tr>
<td>Insurance</td>
<td>10</td>
</tr>
<tr>
<td>Variable costs</td>
<td></td>
</tr>
<tr>
<td>Repairs and maintenance</td>
<td>30</td>
</tr>
<tr>
<td>Labour</td>
<td>40</td>
</tr>
<tr>
<td>Fuel</td>
<td>120</td>
</tr>
<tr>
<td>Total cost</td>
<td>472</td>
</tr>
<tr>
<td>Net benefit</td>
<td>543</td>
</tr>
</tbody>
</table>
Example 2: Break-even point for post-harvest machinery

The relative costs of owning a sheller or thresher are compared to those of custom hiring. The cost data is shown in the table on the right.

In order to determine the number of tons necessary to cover the costs of the sheller, it is necessary to know the charges that custom hirers set in the market. In this example the charge is $12.5 per ton. To arrive at the number of tons necessary to break even you will need approximately 460 tons:

\[
\frac{\text{Cost of owning} - \text{Custom hirer charge}}{\text{Cost per ton}} = \frac{\$3,993 - \$12.5 \times \text{tons}}{\$3.8/\text{ton}} = \text{approximately 460 tons}
\]
Investment is a matter of choice. The choice of investment opportunities for the hire service business are many – as are the returns that these investments offer. Hire service owners will be required to make choices between alternative investment opportunities: (i) whether or not to purchase a tractor or power tiller to provide land preparation or tillage services, (ii) whether or not to buy a water pump to provide a new service, (iii) whether or not to invest in a trailer so as to offer transport services.

It is necessary for hire service providers to understand what is meant by a capital investment and the type of investments that they need to make. This knowledge will affect the way hire service owners will plan their activities, and particularly so because capital for investment in machinery is often scarce and expensive.

**Learning Objectives**

- Understand what a capital investment means for the hire service business;
- Recognize that the feasibility of investments in mechanization may vary depending on the availability of capital and the timing of expected costs and returns.

**Key Questions**

1. What are investment decisions?
2. What are the consequences of investing?
3. Why do hire service providers need to invest?
KEY POINTS TO COVER

• Investment decisions are choices between alternative investment opportunities.
• Decisions to purchase machinery and equipment tie up cash in capital investments. The use of these investments typically lasts for several years.
• Capital investments can take two forms – working capital and investment capital.
• Investing in capital items often means that a large expense occurs in a one time period with income generated from the investment distributed over a number of future periods.
• Businessmen invest because they believe that long-term returns are greater than any immediate return.

TRAINER’S GUIDE

1. Start a discussion among participants on the definition, nature and importance of capital investments for the expansion of the hire service business.
2. Following the discussion explain what capital investments are. Have the participants differentiate between two types of capital: (i) working capital, (ii) investment capital. Discuss the difference between the two and provide concrete examples. List examples on the board.
3. Brainstorm on different uses of capital and the type of investments that hire service providers make. Discuss why they make these investments.
4. Encourage the participants to think about the methods they would use to appraise these investments. Point out that investors tend to make decisions on the basis of instinct and that these instinctive reasons can be sound if based on experience, but they may also not be objective. Discuss weaknesses of such methods.
5. Conclude by explaining that the participants will learn some simple ways of appraisal in the next session.
**Handout 3.3. Capital Investments for Hire Services**

**Investment decisions**

Investment is a matter of choice. There are many investment opportunities to make a hire service business grow: purchase a pair of draught oxen or a small tractor and implements; buy a truck to support the hire service; choose a brand of machinery and equipment over another. The choices are many and the best policy to follow is to consider the importance of the capital item, the need for it and the capital available for investment.

**Capital investments**

Capital investment decisions are particularly important. They tie up much money and determine the business’s future profitability for many years ahead. Good profits arise from correct investment decisions made in the past. Investment can take different forms: one can be to purchase machinery and equipment that support the growth of the business; another one can be to buy spare parts and other inputs for the business because spare parts can be stored and are an addition to the stock of capital. This is referred to as “working capital”, that is the capital needed to buy the goods and services needed to conduct the day to day activities.

**Why do business people invest?**

Investments need to produce a long-term benefit greater than their initial costs. This is known as the “return on capital”. However, most capital assets are eventually used up (e.g. an ox can die or a tractor can be broken up for scrap). A business person investing in a capital item (asset) hopes to cover the value of the original investment by the end of its productive life. The productive life of a capital asset may be prolonged by regular maintenance and repairs. Hire service providers have to take all of these factors into account when making an investment decision.
Cash is the life-blood of a business. Unless a business has enough cash to pay for inputs, labour and other costs, it will not be possible to run a hire service business. Wise business people always work out ahead of time their cash out-flows: how much cash they will need and when they will need it. They will compare that to their cash in-flow: how much cash they can access and when they can access it. Together these two flows of money make up the cash flow. Determining their cash flows enables them to identify the times in the year when they may run short of cash and, based on that, make plans to raise in time the cash needed.

**Learning Objective**
- To understand the concept of cash flow and its impact in managing a hire service business

**Key Questions**
1. What is cash flow?
2. What is cash in-flow?
3. What is cash out-flow?
**KEY POINTS TO COVER**

- A cash flow shows business people how much cash flows into the business each month and how much flows out of the business over a certain period of time.
- If at any time the cash flow out exceeds the cash flow in, then a business person knows that he or she will have to find extra cash for that month.
- A cash flow can also be developed to look at the availability of cash to cover investments in machinery and equipment.
1. Get the participants to form groups to carry out this exercise. Each group should review the practical example given in the box below.

2. Each group should imagine that they are in the hire service business and should agree on a range of services for offer. They should be encouraged to adapt the example to their specific circumstances so that realistic data is used.

3. The groups should calculate a cash flow based on a mechanization service operation that they are familiar with. They should follow the procedure given in the example and attempt to answer the following key questions:
   a. Will we have enough cash available to pay for the implement?
   b. Will we need to borrow cash, and if so how much and when will we need it?

**Example cash flow exercise**

In September the business has no expenses.
In October the hire service provider will pay $90 for labour.
In November the expenditures are $50 for fuel, $50 for spare parts and $90 for labour
In December $20 for oil and lubricants.
In January $54 for salaries of operators.
In February, March and April no expenses.
In May $90 for the salaries of operators for shelling operations
In June the business generates an income of $1,590.

Write the above information into a cash flow table as shown on page 76 following the steps given on the next page.
Step 1: Add up the costs for each month.
- In September the entrepreneur needs no cash.
- In October he needs $90.
- In November he needs $190.
- In December he needs $20.
- In January he needs $54.
- In February, March and April he needs no cash.
- In May he needs $90.

He will spend a total of $444 over the whole season.

Step 2: For each month ask: Does the service provider have enough cash, or does he need to borrow the money?

Step 3: Write “Cash needed” under the last activity. Add up the amounts for each month and put the total at the bottom on the same line as “Cash needed”.

Step 4: Identify how much cash will flow into the business (the entrepreneur has an income of $1,590 from service operations in June).

Step 5: Get the participants to look at Figure 3.4.1. & 3.4.2. in handout 3.4.

Step 6: Ask them what the difference is between the two figures.

Step 7: Make them follow the procedures given in the example and attempt to answer the following questions:
- Will the business have enough cash available to pay for the equipment?
- Will the business need to borrow cash, and if so how much and when will it be needed?
<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>SEP</th>
<th>OCT</th>
<th>NOV</th>
<th>DEC</th>
<th>JAN</th>
<th>FEB</th>
<th>MAR</th>
<th>APR</th>
<th>MAY</th>
<th>JUN</th>
<th>JUL</th>
<th>AUG</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash inflow</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.59</td>
</tr>
<tr>
<td>Sales of services/goods</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.59</td>
<td>0</td>
<td>0</td>
<td>1.59</td>
</tr>
<tr>
<td>Cash available</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.59</td>
</tr>
<tr>
<td>Cash outflow</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buy fuel</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50</td>
</tr>
<tr>
<td>Buy spare parts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50</td>
</tr>
<tr>
<td>Buy oil and lubricants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>Labour-hired</td>
<td>90</td>
<td>90</td>
<td>20</td>
<td>54</td>
<td>90</td>
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<td></td>
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<td>224</td>
</tr>
<tr>
<td>Cash outflow</td>
<td>90</td>
<td>190</td>
<td>20</td>
<td>54</td>
<td>90</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td>444</td>
</tr>
<tr>
<td>Net cash flow</td>
<td>-90</td>
<td>-190</td>
<td>-20</td>
<td>-54</td>
<td>-90</td>
<td>1590</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>146</td>
</tr>
</tbody>
</table>

According to the cumulative net cash flow calculation the business will need additional cash over the first nine months of the year.
Handout 3.4. Understanding Cash Flow

Cash is the life-blood of a business. Unless a business has enough cash to pay for the inputs, labour and other costs, the business will not be sustainable. A wise business person always works out ahead of time his or her cash outflow. The cash outflow should be compared to the cash inflow: how much cash can be accessed and when. Together they make up the cash flow. Determining the cash flow enables hire service providers to identify the times in the year when they may run short of cash and, based on that, make a plan to raise the cash needed on time. An example of a monthly cash flow for a hire service business is given in Figure 3.4.1. The cash flow in the figure includes a savings of $300 in January accumulated in the previous years of the business. This is treated as a cash inflow. In addition, the business manages to secure a $500 loan from a micro-finance organization, $40 of which has to be repaid at the end of the year. The net cash flow shows that there are shortfalls of cash in the months of September, October, November and December, when outflows exceed inflows of funds. However, the cumulative cash flow indicates that there are adequate funds from the previous months to cover these financial shortfalls. The cumulative cash flow shows a surplus for every month of the year. The cash flow projection for the hire service business suggests that, as long as the projections of revenues from custom hire services and expenses hold true, the financial situation of the business is sound and there is no need for any further funding. The cash flow can also be presented over a number of years as given in Figure 3.4.2. This example shows a tractor and planter being bought for use on the farm and for custom work in its vicinity. This example confirms that purchasing a tractor and equipments is difficult for a small-farm family. In the example the farm family attempts to increase its own maize area to 6 ha and also to custom plough a further 20 ha a year, but the effort puts the family increasingly in debt. This can be seen from the annual balance which shows financial shortfalls in the first, sixth and eight year. The cumulative net cash flow shows an even more severe situation with financial shortfalls for all of the year projects. The implication is that the farmer will need to take out loans to fund the machinery and equipment bought. And the loans do not come free; the farmer has to repay them with interests. In figure 3.4.2 the loan receipt and repayment appear at the bottom of the cash flow table. The loan itself is a cash inflow, while repayment of the principal and interests are a cash outflow. In this example, the farmer can obtain two loans of $30,000 each in years 1 and 6, with a repayment schedule of $7,985 for each year. The conclusion is that the loan package is inadequate to cover the financial shortfall that the farmer experiences. The last row – the cumulative net cash flow (after loan receipt and repayment) still shows a shortfall for each year projected. The cash flow is, consequently, a very important and useful tool to know if the farmer service provider has the money to buy the machinery and equipment.
FIGURE 3.4.1. MONTHLY CASH FLOW FOR HIRE SERVICE PROVIDERS

<table>
<thead>
<tr>
<th>MONEY COMING IN</th>
<th>JAN.</th>
<th>FEB.</th>
<th>MAR.</th>
<th>APR.</th>
<th>MAY</th>
<th>JUN.</th>
<th>JUL.</th>
<th>AUG.</th>
<th>SEPT</th>
<th>OCT.</th>
<th>NOV.</th>
<th>DEC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Savings at start:</td>
<td>300</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Loan</td>
<td>500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Hire services:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Ripping/ seeding (3 ha @ $225/ha)</td>
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<td>675</td>
<td>675</td>
<td>675</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irrigation (2 ha @$40/ha)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>80</td>
<td>80</td>
<td>80</td>
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<td>Shelling</td>
<td></td>
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<td></td>
<td></td>
<td>800</td>
<td>800</td>
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<td>100</td>
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<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
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<td>50</td>
</tr>
<tr>
<td>TOTAL (A)</td>
<td>1100</td>
<td>825</td>
<td>825</td>
<td>825</td>
<td>825</td>
<td>930</td>
<td>930</td>
<td>930</td>
<td>230</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MONEY GOING OUT</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Expenses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel and oil</td>
<td>41</td>
<td>41</td>
<td>41</td>
<td>41</td>
<td>41</td>
<td>41</td>
<td>41</td>
<td>41</td>
<td>41</td>
<td>41</td>
<td>41</td>
<td>41</td>
</tr>
<tr>
<td>Repairs and maintenance</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Labour expenses</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>Spare parts</td>
<td>200</td>
<td>200</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household expenses</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Loan repayment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL (B)</td>
<td>431</td>
<td>431</td>
<td>231</td>
<td>231</td>
<td>231</td>
<td>231</td>
<td>231</td>
<td>231</td>
<td>231</td>
<td>231</td>
<td>231</td>
<td>271</td>
</tr>
</tbody>
</table>

| MONTHLY BALANCE (A – B)  | 669  | 394  | 594  | 594  | 699 | 699  | 699  | 699  | -101 | -31  | -31  | -71  |
| CUMULATIVE NET CASH FLOW | 669  | 1063 | 1063 | 2251 | 2845| 3544 | 4243 | 4942 | 4841 | 4810 | 4779 | 4748 |
**FIGURE 3.4.2. CASH FLOW FORECAST TO SHOW THE COSTS AND RETURNS FOR A FARMER WISHING TO INVEST IN A TRACTOR AND SEEDER.**

<table>
<thead>
<tr>
<th>MONEY COMING IN</th>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>YEAR 3</th>
<th>YEAR 4</th>
<th>YEAR 5</th>
<th>YEAR 6</th>
<th>YEAR 7</th>
<th>YEAR 8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sales:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maize (6 ha @ $225/ha)</td>
<td>1350</td>
<td>1350</td>
<td>1350</td>
<td>1350</td>
<td>1350</td>
<td>1350</td>
<td>1350</td>
<td>1350</td>
</tr>
<tr>
<td>Custom planting (20 ha @$40/ha)</td>
<td>800</td>
<td>800</td>
<td>800</td>
<td>800</td>
<td>800</td>
<td>800</td>
<td>800</td>
<td>800</td>
</tr>
<tr>
<td>Tractor scrap</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5000</td>
</tr>
<tr>
<td>Planter scrap</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>200</td>
</tr>
<tr>
<td>TOTAL (A)</td>
<td>0</td>
<td>2150</td>
<td>2150</td>
<td>2150</td>
<td>2150</td>
<td>7150</td>
<td>2150</td>
<td>2350</td>
</tr>
</tbody>
</table>

| MONEY GOING OUT |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|
| **Expenses:**   |        |        |        |        |        |        |        |        |
| Maize inputs (seed, fertilizer) | 123    | 123    | 123    | 123    | 123    | 123    | 123    | 123    |
| Planter repairs and maintenance | 21     | 21     | 21     | 21     | 21     | 21     | 21     | 21     |
| (26 ha @ 2h/ha @ $0.40/h)       |        |        |        |        |        |        |        |        |
| Tractor repairs and maintenance | 837    | 837    | 837    | 837    | 837    | 837    | 837    | 837    |
| (26 ha @ 2h/ha @ $16.1/h)       |        |        |        |        |        |        |        |        |
| **Capital equipment:**          |        |        |        |        |        |        |        |        |
| Tractor          | 30000  |        |        |        |        |        |        |        |
| Planter          | 2000   |        |        |        |        |        |        |        |
| TOTAL (B)        | 32123  | 981    | 981    | 981    | 981    | 30981  | 981    | 2981   |

<table>
<thead>
<tr>
<th><strong>ANNUAL BALANCE (A – B)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>-32123</td>
</tr>
<tr>
<td>1169</td>
</tr>
<tr>
<td>1169</td>
</tr>
<tr>
<td>1169</td>
</tr>
<tr>
<td>1169</td>
</tr>
<tr>
<td>-23,831</td>
</tr>
<tr>
<td>1169</td>
</tr>
<tr>
<td>-631</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>CUMULATIVE NET CASH FLOW</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>-32,123</td>
</tr>
<tr>
<td>-30,954</td>
</tr>
<tr>
<td>-29,785</td>
</tr>
<tr>
<td>-28,616</td>
</tr>
<tr>
<td>-27,447</td>
</tr>
<tr>
<td>-51,278</td>
</tr>
<tr>
<td>-50109</td>
</tr>
<tr>
<td>-50,74</td>
</tr>
</tbody>
</table>

**Use these lines to work out the effect of taking a loan:**

<table>
<thead>
<tr>
<th>Loan (inflow)</th>
<th>30000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loan repayment (outflow)</td>
<td>7985</td>
</tr>
<tr>
<td>CUMULATIVE NET CASH FLOW (after loan receipt and repayment)</td>
<td>-2,123</td>
</tr>
</tbody>
</table>
Session 3.5. highlights some of the investment decisions that hire service providers are likely to face. It introduces some simple methods of making investment decisions. These are called (i) the payback period and (ii) the simple rate of return. The best policy to follow depends on the income that can be earned from the service and the capital available for investment. It is useful for hire service providers to thoroughly appraise their investments before making any final decision, therefore it is important to know how to choose and apply simple investment appraisal methods.

**Learning Objectives**

- Understand two simple methods of appraising investments
- Learn the differences between the two methods
- Understand the strengths and weaknesses of both methods

**Key Questions**

1. What is an investment?
2. How do I know if the machinery is profitable?
3. How do I calculate profitability over time?
4. What are the simple methods of appraisal?
5. What is the drawback of this method?
KEY POINTS TO COVER

- The payback period calculates the number of years it would take for an investment to cover its original cost through the annual cash benefits generated.
- An investment with a short payback period is more attractive than one with a longer payback period.
- The simple rate of return expresses the average annual net income as a percentage of the investment but fails to consider the size and timing of annual earnings.

TRAINERS GUIDE

1. Initiate a discussion of the data needed for the simple methods of investment appraisal. Ask the participants to suggest what items are needed (initial investment cost, annual costs and benefits) and list them.
2. Explain the two main ways to measure the benefits and costs of investments. The payback period and (ii) the simple rate of return are popular and easy to compute; both are discussed here.
3. Explain how the payback period is computed and mention advantages and disadvantages. Discuss what decision criteria should be used in order to select the most attractive investment.
4. Show how the simple rate of return is computed. It is important to explain how the average annual net income is derived.
5. Interpret, rank and differentiate the result using the payback period method.
6. Explain the strengths and weaknesses of this method.
Hire service providers can use different methods to appraise investments with different timings of costs, returns and benefits. Investing in farm machinery typically means that a large expense (the initial purchase) occurs in one time period, while the benefits are distributed over a number of future time periods. Appraisal of mechanization investments requires a set of background information that includes (i) an estimate of the expected annual net income from the machinery, (ii) the initial cost of the machinery, (iii) the salvage value (the value of the asset that remains unused), and (iv) the interest or discount rate to be used. The following methods can be used for assessing the profitability of an investment:

- payback period
- simple rate of return

Each of these methods has advantages and disadvantages. Since investment decisions for mechanization can be quite complicated, it is assumed that hire service providers may need to be assisted in selecting the appropriate method.

**Payback period**

The payback period method calculates the number of years it would take for an investment in machinery (or equipment) to return its original cost through the generation of income. This method assesses the time that is required until the cumulative income from the investment equals its initial cost. The method is useful to highlight those investments that are not viable (e.g. the ones that never achieve payback). It can also be used to select the most appropriate source of financing. For instance, those investments having a short payback period would only require short-term financing.

To calculate the payback period, hire service providers need to assess the annual cash flow that is expected after making the capital investment. This is the difference between the cash inflows and cash outflows for each year in the future. In comparing any two investments, the one having a shorter payback period would be more attractive than the one with a long payback period.
**Example: Annual cash flow for two mechanization investments**

There are two investments outlined below. In investment A the hire service provider decides to buy a 15 hp two wheel tractor together with a seeder and ripper for combined tillage operations. In investment B the decision is to buy the same 2 wheel tractor but together with a sheller for maize shelling. In the hypothetical example given below, each package of machinery requires an initial capital outlay of $5,000 but gives rise to different patterns of cash flows. For simplicity, the salvage values are assumed to be zero\(^*\). It is customary to treat the initial cost of the investment as if it occurs in year 0.

<table>
<thead>
<tr>
<th>Year</th>
<th>Investment A</th>
<th>Investment B</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>($5,000)</td>
<td>($5,000)</td>
</tr>
<tr>
<td>1</td>
<td>1500</td>
<td>500</td>
</tr>
<tr>
<td>2</td>
<td>1500</td>
<td>1000</td>
</tr>
<tr>
<td>3</td>
<td>1500</td>
<td>1500</td>
</tr>
<tr>
<td>4</td>
<td>1500</td>
<td>2000</td>
</tr>
<tr>
<td>5</td>
<td>1500</td>
<td>3000</td>
</tr>
<tr>
<td>Total</td>
<td>7500</td>
<td>8000</td>
</tr>
<tr>
<td>Payback period (yrs)</td>
<td>3.3</td>
<td>4.0</td>
</tr>
<tr>
<td>Avg. annual cash flow (5 yrs)</td>
<td>1500</td>
<td>1600</td>
</tr>
<tr>
<td>Less annual depreciation</td>
<td>-1000</td>
<td>-1000</td>
</tr>
<tr>
<td>Average annual net income</td>
<td>500</td>
<td>600</td>
</tr>
</tbody>
</table>

\(^*\)Whenever salvage values exist, they should be added to the net cash revenue because they represent an additional cash receipt.
Investment A: 2WT and seeder-ripper

When the annual cash flow is the same for each year of the investment, the payback period is calculated by dividing the amount of the investment by the expected annual cash flow. The payback period is, therefore, 3.3 years because the cost of the investment ($5000) is divided by the annual average cash flow ($1500).

Investment B: 2WT and Sheller

When the cash flows are irregular and unequal they are accumulated and the payback period is assessed by taking the year where the cash flow is equal to the cost of the investment. The payback period is therefore 4.0 years. The cumulative net cash flow covers the cost of the investment ($5000) in year 4. Therefore, investment A – the 2WT with seeder/ripper - is preferred over investment B because it has a shorter payback period.

The payback method is attractive because it is easy to calculate and is a simple way of comparing alternative investments. It is also easily understood by business people. If the business is short of cash, it is essential that income is generated as soon as possible.

However, also the payback method has deficiencies: it ignores the cash flows arising after the payback has occurred as well as the timing of the income flows. Money received earlier in the life of the investment is more valuable than money received later. For example, by selecting investment A, the method ignores the higher cash flows from investment B in years 4 and 5.

The payback period does not really measure profitability, but is more a measure of how quickly the investment will contribute to the liquidity of the business.

**Simple rate of return**

The simple rate of return recognizes that it is not only the income that is important to the business but also the amount of capital used to produce it. Income is regarded as a return on the capital used. More precisely, the rate of return expresses the average annual net income as a percentage of the investment.
The concept of net income is used and is calculated by subtracting the average annual depreciation of the investment from the average annual net cash flow, as shown in the previous example (annual cash flow for two investments). The return on capital is calculated as follows:

\[
\text{Simple rate of return} = \frac{\text{Average annual net income}}{\text{Cost of investment}} \times 100
\]

A return on capital is compared to the cost of capital and is used in comparing alternative investments.

**Investment A**

\[
\frac{1500}{5000} \times 100 = 30\% 
\]

**Investment B**

\[
\frac{1600}{5000} \times 100 = 32.0\% 
\]

This method ranks investment B higher than investment A. This is a different result from the one obtained using the payback period method. The rate of return is preferred to the payback period because it considers the earnings of the investment over its entire life.

The advantage is that it is easier to calculate and to rank competing investment opportunities. Investments with higher rates of return are naturally preferred. However, this method uses average annual income, and thereby fails to consider the size and timing of the annual income flow thus possibly making errors in the investment selection. This can be particularly true when there is increasing or decreasing net income. Furthermore, the method ignores the time value of money.
Investments often involve tying up money for a period of time. This money may have been borrowed and, therefore, it is important for service providers to understand whether or not they can repay loans. Also, the hire service business must consider repayment in terms of its effect on cash flow. It is particularly useful to assess the cash flow of an investment after negotiating a financial package. This session considers one way of assessing the capacity of a hire service business to repay loans subscribed to finance a machinery investment. The appraisal is calculated on the net cash flow projection before financing.

**Learning Objectives**

- Understand the concept of debt repayment capacity
- Apply methods of assessing the capacity of the investment to cover debt services and repay loans

**Key Questions**

1. What is a loan appraisal?
2. When to conduct a loan appraisal?
3. How to conduct a loan appraisal?
4. How to understand what kind of financial package is needed for the business?
KEY POINTS TO COVER

- The capacity of a hire service business to repay a loan is assessed by examining the cash flow after taking into account the loan and the repayment of interest and principal.
- The loan appraisal treats the loan as an inflow and the repayment of debt as an outflow.
- Debt repayment is conducted on the outstanding balance of the loan.
- Net financing is calculated as the difference between the value of the loan taken and the repayment of interest and principal.
- The net cash flow after financing is calculated by deducting the net financing costs from the cash flow before financing.
- The cumulative cash flow is calculated to assess whether the hire service business's income and loans cover costs.
- A negative cumulative cash flow indicates that the service provider requires either additional financing to cover a debt shortfall or better terms of financing.
- The loan appraisal provides the hire service provider with information to allow him or her to renegotiate a loan package.
1. Distribute Handout 3.6. to the participants before the start of the session.

2. Encourage the participants to discuss the type of data needed to conduct a loan appraisal (interest on loan, time span of loan, cash flow, and principal payment periods). Write suggestions on the board.

   **Participants should be aware that the presentation of cash flow is a little different from the monthly cash flow schedule. Also point out that in accounting terms loans should be received at the end of the year and the loan repayment is made in the consecutive year.**

3. Discuss the concept of loan appraisal. Explain how loan appraisal is computed with an emphasis on the declining balance. Reiterate that the cash flow streams presented previously can be set up in another way, closer to the concept of cash flow given in Session 3.6.

4. Ensure that the participants have a clear understanding of the concept of the time value of money. Try to involve trainees in role playing.

5. Using the Table in handout 3.6., follow the example and select a participant as a service provider who has taken a loan of $1,000 at 10% interest with a repayment period of 5 years. The service provider has different options: either renegotiate the repayment of the long-term loan, or provide additional working capital to cover the financing deficits or receive grants from friends or family. Encourage all the participants to “play the game” and give solutions alongside those provided by the participant who is playing the role of the hire service provider.
What is a loan appraisal?

It is essential that hire service providers are able to manage loan repayments through their business before taking out a loan. The capacity to repay loans is assessed by looking at their effect on the cash flow of the business. The appraisal builds on the net cash flow projection as discussed in this session. The presentation of the cash flow is, however, seen a little differently.

When to use a loan appraisal?

In many cases, financial institutions will require a loan appraisal before approving a loan. However, non-formal financial service providers may not require such an analysis. In these cases, the analysis is still important so that service providers do not become indebted beyond their capacity to pay. Once a business has a poor credit history, it becomes very difficult to access finance in the future.

Procedure

The first step in a loan appraisal is the development of the cash flow of the business. The cash flow should be projected for periods that correspond to the term and the payment schedule of the loan. Therefore, for short-term loans (under a year), with periodic payments, the appraisal should be projected on a monthly basis. For longer term loans, the analysis can be projected on a quarterly or even annual basis. It is important to remember, however, that cash availability (called liquidity) can vary significantly throughout the year. Therefore, it is important to ensure that the loan appraisal projection is prepared with enough details to guarantee that cash will be available at the exact time when loan payments are due.

The annual net cash flow is presented vertically (as shown in the table on the next page). The horizontal rows explain in detail the net financing costs, the net cash flow after financing and the cumulative net cash flow. The methodology of appraising the capacity of the hire service business to pay back the loan is also different following the accounting convention that loans are to be received at the end of the year and the debt service repayment is made in the consecutive year.
## Example

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>YR 1</th>
<th>YR 2</th>
<th>YR 3</th>
<th>YR 4</th>
<th>YR 5</th>
<th>YR 6</th>
<th>YR 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash flow before financing</td>
<td>-2600</td>
<td>2500</td>
<td>2500</td>
<td>2500</td>
<td>2500</td>
<td>3000</td>
<td>2500</td>
</tr>
<tr>
<td><strong>LOANS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-term loans</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>OUTSTANDING BALANCE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-term loans</td>
<td>1.000</td>
<td>800</td>
<td>600</td>
<td>400</td>
<td>200</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>REPAYMENT OF PRINCIPAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-term loans</td>
<td></td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>0</td>
</tr>
<tr>
<td><strong>INTEREST PAYMENTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-term loans</td>
<td></td>
<td>100</td>
<td>80</td>
<td>60</td>
<td>40</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td><strong>TOTAL COST OF FINANCING</strong></td>
<td></td>
<td>300</td>
<td>280</td>
<td>260</td>
<td>240</td>
<td>220</td>
<td>0</td>
</tr>
<tr>
<td>Net financing (inflow of financing less principal and interest payments)</td>
<td>1000</td>
<td>-300</td>
<td>-280</td>
<td>-260</td>
<td>-240</td>
<td>-220</td>
<td>0</td>
</tr>
<tr>
<td><strong>NET CASH FLOW AFTER FINANCING</strong></td>
<td>-1600</td>
<td>2200</td>
<td>2220</td>
<td>2240</td>
<td>2260</td>
<td>2780</td>
<td>2000</td>
</tr>
<tr>
<td>Cumulative cash flow</td>
<td>-1600</td>
<td>600</td>
<td>2820</td>
<td>5060</td>
<td>7320</td>
<td>10100</td>
<td>12100</td>
</tr>
</tbody>
</table>
A hire service business takes out a loan for $1000 at 10 percent interest over a repayment period of 5 years. The calculations involved in appraising the capacity of the business to repay the loan are described as follows:

The hire service business receives a $1000 loan at an interest rate of 10 percent. Thus the interest paid in year 2 is $100. The principal on the loan has to be repaid with equal installments of $200 annually over a 5-year period. The interest payment for year 3 is calculated on the outstanding balance of the loan after the principal has been repaid. We assume that the loan repayment is made at the end of the year, so interest is due on the full amount of the principal outstanding balance at the end of the previous year. In year 3, the outstanding balance is the $1000 loan minus $200 repaid as the first installment of the principal, that is $800. The interest on $800 is $80 ($800 x 10 percent), and this is entered as repayment on interest in year 3.

For year 6 the outstanding balance at the end of the previous year has been reduced by the principal repayment of $200 made at the end of year 5, so the interest is calculated on the outstanding balance of $200 and amounts to $20. In this particular example, the cumulative cash flow is positive for every year of the investment, starting from year 2. This suggests that the hire service business has a liquidity problem in year 1 but in year 2 is able to finance the costs of the loan. If the cumulative net cash flow shows a financial shortfall, i.e. a negative figure in any year, the implication is that the hire service business would need to find additional financing to cover that shortfall.

The difference could be made up either by renegotiating the repayment of the long-term loan, or utilizing equity capital, or providing additional working capital to cover the financing deficits or receiving grants from friends or family.
Developing demand for hire services is crucial for the business to prosper and become sustainable. This involves selling the service to the right customers and market niche. Understanding the current and future demand for the service is vital.

**LEARNING OBJECTIVE**

- To understand how is it possible to assess the demand for a specific service

**KEY QUESTIONS**

1. Who are my customers?
2. What services do they want?
3. How can you assess the current demand for your products or services?
4. What information do you need to assess the demand for your service and market share?
5. How would you assess future demand?
6. What can you do to expand demand for your service?
7. What would your marketing strategy be?
8. What do you need to consider to set your prices?
KEY POINTS TO COVER

• An effective marketing strategy is crucial to ensure continuing profits.

• When developing the demand for hire services there are three important factors to take into account.
  ➡ The priority of the buyer.
  ➡ A process of selection.
  ➡ Relationship building.

• It is important to address the following questions: what types of farmers are using which services and for which operations? What types are not? How aware are farmers about your services? Which benefits are the farmers expecting from the services offered?

• The most effective way to develop demand is to provide quality and cost effective services in a timely manner. Field days and demonstrations are also popular ways of expanding the market.
This exercise is to be conducted as group work.

1. Divide the participants into groups. Each group should select a line of business related to mechanization (machinery/spare parts dealer, repairs and maintenance workshop, hire service provider etc.). The participants should imagine that these businesses are new and have no customers.

2. Ask each group to list the type of information they require to assess the demand for their products/services. Get them to list the questions necessary to gather the needed information. Draw the table below on the board and get each group to complete it.

<table>
<thead>
<tr>
<th>INFORMATION NEEDED</th>
<th>QUESTIONS TO BE ASKED FOR DATA COLLECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Ask the groups to share their list of information needed and write the most common ones on the white board.

4. Ask the groups their list of questions for data collection and write some of these on the white board. Explain that this is necessary to understand needs and wants of customers in order to tailor your products and services to meet their demands.

5. Ask the groups to list the type of services they feel should be offered to prospective customers?

6. Ask the groups for examples of businesses that may have good products but unfriendly services. Are these businesses likely to succeed or not, and if not why?
7. Ask the groups to list the range of products or services they expect to provide. Encourage a discussion on whether or not a business should provide few or many services at the beginning. Together give examples of businesses which try to do too many different things at once.

8. Ask groups what services are needed and what factors they consider to be important to develop their business (price, competition, supplies).

9. Ask participants how they would decide on a proper price and profit for a product?

10. Get a representative from each group to give a feedback and open to further discussion in the plenary.
Services to offer

One of the first challenges and probably the most decisive one is ‘What service to offer?’ This challenge is usually viewed from a market perspective. What is the market demand for such a service in the local area? What equipment do small-scale farmers already own in terms of tools and implements, draught animals and machinery? And what can be bought locally and is within reach of small-scale farmers’ budgets?

With an effective marketing strategy service providers can ensure continuing profits. Service Providers will only expand their business when they think they can earn a profit in doing so. When developing the demand for hire services there are three important factors to take into account.

1. *The priority of the buyer.* Developing demand begins not with the service offered, but with what the farmer wants. This requires some market investigation. There is no point in providing a service or good that the customers do not want. Hire service providers need to understand what their customers really want.

2. *A process of selection.* The hire service provider must decide to whom to provide the services. The service has to be geared to the customer. The customer could be a smallholder farmer, a commercial farmer, a rural entrepreneur demanding transport services, or a farmer organization or cooperative. This aspect of demand assessment determines how and where the service should be offered. Considerations are, of course, the size of the market demand, the costs involved with each option and the need to make profit.

3. *Relationship building.* Expanding demand includes working with the customers. Customers should not be cheated. Strong relationships need to be built up. This means that agreements will be honored and commitments to supply services will be kept. It means delivering consistent quality service. Trust between the service provider and customer must be built and nurtured.
Demand:

- What types of farmers are using which services for which operations? What types are not?
- What benefits are farmers expecting from the services provided?
- How aware are farmers about services? Do the farmers understand the benefits of the services offered?

The most effective way to develop demand is to provide quality and cost effective services in a timely manner. Satisfied customers are likely to spread the word of the services offered by word of mouth. As a businessperson you can also be active in developing the market by promoting your business through the media or by making field visits to potential clients located in potential areas. Field days and demonstrations are also popular ways of expanding the market. Personal promotion is often the most effective way of developing demand. Potential customers interested in hire services may need to understand better the benefits of 2WT services and may desire to discuss the range of services offered, the potential benefits and the custom hire charges proposed. In this situation, the task of the business owner is to explain the choices available and to suggest the most suitable strategy.

- it is a two-way form of communication, giving the potential purchaser of the service the opportunity to ask questions about the service.
- the message can be made more flexible depending on the needs of the individual customers.
- the owner or a staff member can use their knowledge of the service to clear any queries from the potential customer.
- most importantly, direct communication can secure an order for the service almost instantly and negotiate the price, timing or other special requirements.

Once the business is able to sell the service, it is recommendable to return to the customer and influence him to utilize more of the same service or to buy a new service.
Planning mechanization is an important activity for service providers and relates to allocating time and use of the machinery: it involves the operations to be provided, the equipment needed and when and to whom the service is to be given.

**LEARNING OBJECTIVE**

- To learn how to plan machinery and equipment over a season to make the best use of them

**KEY QUESTIONS**

1. Why plan machinery?
2. How to plan machinery?
3. What information is needed?
**KEY POINTS TO COVER**

- Machinery planning is needed to:
  - Assess changes on the scope of services offered
  - Introduce new or better machines
  - Respond to financial constraints
  - Meet target dates and reduce overtime
  - Aid management in general
  - Respond to changes in regulations and legislation

- Machinery planning requires reviews on a regular basis throughout the year.

- This type of planning exercise can only be carried out once the service provider knows the expected demand for each of the service operations and its timing.

- Planning can also occur at the level of specific operations in order to improve their performance.

- In order to plan effectively we need data to show the sequence of operations for each crop, the number of days available for the different operations, the demand for each operation and the actual time an operation is likely to take.

- Planning can also include estimating the number of people needed to operate the machinery and/or assist in shelling and threshing cereals.

- Gantt charts must be prepared to indicate how much labour and machinery are needed for different operations.

- Information can be found in farm records/diaries from previous years’ activities.

- Hire service providers should encourage farmers to maintain these records.
**Exercise 1**
1. Get the participants to form groups. Each group should represent a different hire service operation.
2. Each group should brainstorm the information they require in order to plan their operations throughout the year.
3. Each group should estimate their customer demand by preparing a mechanization plan as presented in Handout 4.1. in order to have their selected machinery operation performed.
4. Get each group to present back to the plenary and engage them in a discussion.

**Exercise 2**
5. Identify specific seasonal activities related to machinery hire service
6. Have the participants sit in the following arrangement and mention the respective key features of each specific month.
Why plan machinery?

*Respond to changes in the range of services offered*

As a hire service provider you may decide to provide a new line of service as farmers make changes to their cropping policies, especially as new markets develop. It is useful to know what effect this will have on the existing labour and machinery requirements.

*Introduce new or better machines*

The introduction of minimum tillage drills can reduce the number of cultivation passes and improve depth of drilling and its timeliness. Service providers will need to know the effect on output and timeliness of new machines bearing in mind the conditions of smallholder farmers in the area.

*Respond to business changes*

A change in circumstances is brought about if the organization of the business changes, for instance if the hire services is organized as a partnership and the partnership arrangement is dissolved. In this case Service Providers will need to know if the remaining share of the machinery inventory can cope with customer’s demands or whether there will be excess capacity.

*Meeting target dates for operations*

Not meeting target dates is a classic sign that equipment is under-sized or that management needs to be improved. The hire service provider needs to know how much additional capacity may be required to avoid delays in operation and over-mechanization.

*Aiding management*

Every business should review its strategies: is it making best use of resources, can work be contracted in/out? ‘What if’ scenarios may be used to review the effect of changes to the hire service business.
Addressing changes in regulations and legislation

If a government announces a tariff on the importation of machineries and equipment and spare parts from a particular country, the hire service business may have to shift to other sources of equipment and spare parts.

Planning mechanization

The hire service business should be reviewed on a regular basis throughout the year. All operations for customers should be scrutinized and planned over a 12-month period. This type of planning exercise can only be carried out once the service provider knows the expected demand for each of the service operations and its timing. This requires forward planning. Planning can also occur at the level of specific operations in order to improve their performance. Here the problems are essentially practical and deal with the way a job is done. They involve the close study of methods of working, the kind of machinery involved and the operator’s efficiency. A very common example is the potential introduction of a ‘new, improved and larger machine’.

The following two figures (1 and 2) are good examples of a calendar of work and use plan for 2WT operations in a maize growing area. The operations for the 2WT are listed in Figure 1 in a maize based area. These include ripping/shelling as a combined operation. The machine can also be used on other crops for irrigation (water pumping) and transportation. For every operation the method is recorded together with the type of labour to be used. Most important is an estimation of customer demand in terms of area, volume and distance. Where additional labour is required, for example in the shelling operation, an estimate of the labour demand also needs to be included. The average output for the operation can be recorded using the service providers own estimate. The tractor days demanded has to be compared with the tractor days available for a proper planning. Figure 1 provides aggregated data for all potential customers but could be developed for each customer separately.
Figure 1: Calendar of work and use plan for 2WT operations in a maize growing area (0 = operator)

<table>
<thead>
<tr>
<th>OPERATION</th>
<th>METHOD</th>
<th>LABOUR</th>
<th>AV. OUTPUT</th>
<th>SEASONAL DEMAND</th>
<th>TRACTOR DAYS DEMANDED</th>
<th>LABOUR DAYS</th>
<th>COMMENTS AND TIMING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planting / ripping</td>
<td>Single row</td>
<td>0</td>
<td>1,2 ha / day</td>
<td>25 hectares</td>
<td>21</td>
<td></td>
<td>At least 2 days before the rains</td>
</tr>
<tr>
<td>Shelling</td>
<td>Double cob</td>
<td>0 + 4</td>
<td>3 tons / day</td>
<td>34 tons</td>
<td>11</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Water lifting</td>
<td>Axial pump</td>
<td>0</td>
<td>3 ha / day</td>
<td>4 hectares</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td></td>
<td>0</td>
<td>4 kil / day</td>
<td>40 km</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Separate plans can be made for each 2WT as in Figure 2 on the following page. Provision is made for six working days a week (48 hours per tractor week) and for four weeks in each month. In practice, there may be more work to do than there is time available and it may be necessary to work seven days a week instead of the normal six. A service provider may need to work the 2WT on double shifts to complete the work.

Tractor plans can reveal, weeks or even months ahead, when time problems are likely to occur. This may necessitate buying another piece of machinery if it is clear from the plan that the business cannot cope with the machinery that currently exists. It is important to allow the 2WT to be used for transportation at times of the year when there are no seasonal demands.
### Figure 2: Tractor Plan

<table>
<thead>
<tr>
<th></th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Operation**: Threshing, Transportation, Ploughing, Planting, Transportation, Harvesting

<table>
<thead>
<tr>
<th>Operation</th>
<th>Week</th>
<th>months</th>
<th>hrs per year for ripping/tractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ripping/planting</td>
<td>3</td>
<td>1</td>
<td>180</td>
</tr>
<tr>
<td>Transportation</td>
<td>20</td>
<td>6</td>
<td>1200</td>
</tr>
<tr>
<td>Treshing</td>
<td>4</td>
<td>1</td>
<td>240</td>
</tr>
<tr>
<td>Ploughing</td>
<td>13</td>
<td>4</td>
<td>780</td>
</tr>
<tr>
<td>Harvesting</td>
<td>8</td>
<td>2</td>
<td>480</td>
</tr>
</tbody>
</table>

**Total maximum available hr.**: 2,880

This suggests that if the 2WT is used with the maximum available hr. (8 hr. per day for 365 days), then the machine will only last for about 2.4 yrs. However with 5 hr. per day and with 45% down time (around 200 operational days) the machine will last for 7 years.
Unmet demand

Figure 3 below provides a calendar of operations – a schedule of the demand and supply of 2WT services. It shows which machinery is required, when it will be needed, and when mechanization requirements cannot be met by the machinery available. The purpose of the calendar is to allow more efficient management of these capital inputs. By showing the service provider what should be done and when, the calendar facilitates the coordination of work and improves the performance of machinery.

In this example it is assumed that the maximum available hour per month is 240 with 8 hours on operation per day (30 days a month). The figure depicts the situation for a hire service business with a demand for the different tractor operations presented on a monthly basis.

Figure 3: Schedule of demand and supply of 2WT services
The figure suggests that;

1. Another 2WT is likely to be needed if the full demand is to be reached for each operation above 240 hours (Unmet demand area).

2. Hire another machine to address the peak demand.

3. Increase the number of hours beyond 8 hours per day.

So a decision must be taken in the additional demand for the tractor for peak demand months. In preparing a calendar of operations the influence of weather should be considered. Dry periods in the season could mean that the number of days available might be less than the 30 days originally assumed in this example.

**Check list of how to prepare a schedule**

- Establish target dates for preparing the soil, planting, harvesting, and shelling/threshing and time available for transportation.
- Establish the sequence of operations for each crop.
- Estimate the number of days available for the different operations and the actual time each of the operations is likely to take.
- Estimate the number of people needed to operate the machinery and/or assist in shelling maize.
**Gantt chart**

An important consideration is the labour utilization and how it is tied up with machinery throughout the year. Sometimes it may be necessary to develop a chart of the labour requirements; the number of people needed to form a work gantt. Work gantts may be needed for grain harvesting, shelling and threshing as some of the operations may be manual. The gantt workday chart is used to depict the size of the gantt within a given time. The chart could be developed for each of the hire service customers. The chart could look like below:

<table>
<thead>
<tr>
<th>Customer</th>
<th>Area (ha.) (a)</th>
<th>Timing (approx.)</th>
<th>Gantt work days (GWDs) (a/b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.3</td>
<td>Mid July- mid August</td>
<td>1.2</td>
</tr>
<tr>
<td>2</td>
<td>0.2</td>
<td>Mid August – mid September</td>
<td>0.8</td>
</tr>
<tr>
<td>3</td>
<td>0.45</td>
<td>Mid September</td>
<td>1.8</td>
</tr>
<tr>
<td>4</td>
<td>0.1</td>
<td>Late September</td>
<td>0.4</td>
</tr>
<tr>
<td>5</td>
<td>1.3</td>
<td>Mid October</td>
<td>5.2</td>
</tr>
<tr>
<td>6</td>
<td>1.4</td>
<td>Late October</td>
<td>5.6</td>
</tr>
</tbody>
</table>

Team Size = 1 ha/ day; Work rate 0.25/ day (b)

<table>
<thead>
<tr>
<th>Operation</th>
<th>Area (ha.) (a)</th>
<th>Timing (approx.)</th>
<th>Team Size/ day</th>
<th>Work rate/ day (b)</th>
<th>Gantt work days (GWDs) (a/b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planting</td>
<td>4</td>
<td>Mid July- mid August</td>
<td>1</td>
<td>0.6</td>
<td>0.66</td>
</tr>
<tr>
<td>Spraying</td>
<td>2</td>
<td>Mid August – mid September</td>
<td>2</td>
<td>0.8</td>
<td>2.5</td>
</tr>
<tr>
<td>Harvesting</td>
<td>1</td>
<td>Mid September</td>
<td>3</td>
<td>0.5</td>
<td>2.0</td>
</tr>
<tr>
<td>Shelling</td>
<td>2</td>
<td>Late September</td>
<td>3</td>
<td>0.5</td>
<td>4.0</td>
</tr>
</tbody>
</table>
Days available for field work are dependent on such factors as soil type and condition, topography, climate, crop type and field operation, machine type and attitude to soil compaction and product quality. Hire service providers must consider when conditions are ideal for many field operations. The timing of field operations - such as spraying - would depend on the weather, rainfall and temperature. Harvesting of grains requires a sequence of dry days. Problems of defining workdays are also compounded by situations where the crop is ‘fit’ to harvest but the weather isn’t suitable and vice versa.

**Sources of information**

The best source of information can be found in farm records/diaries from previous years’ activities. Good record keeping is a must even if one year in ten may be the wettest on record. Good planning is impossible unless there is a supply of good data. The best data are the farmer’s own records/field diaries. For farmers wishing to record their own performance the following type of form could be used.

<table>
<thead>
<tr>
<th>DATE</th>
<th>PLOT</th>
<th>PERIOD</th>
<th>HOURS NOT ON OPERATION</th>
<th>HOURS ON OPERATION</th>
<th>TONS COMPLETED</th>
<th>NO. MEN</th>
<th>COMMENTS (CONDITIONS, REASONS FOR DELAYS ETC.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/11/16</td>
<td>Lower</td>
<td>START 8 am</td>
<td>FINISH 5 pm</td>
<td>2</td>
<td>7</td>
<td>2.5</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Wet conditions; 1 hour breakdown</td>
</tr>
</tbody>
</table>

...
Records are a critical part of any successful and profitable business. Without records no business person can evaluate, diagnose or properly plan his/her business. Records do not have to be sophisticated or complex, but they do have to record the information needed by the business person in a way that is easy to use and understand.

**Learning Objective**
- To understand and appreciate the importance of keeping business records

**Key Question**
1. Why are records important?
KEY POINTS TO COVER

• Setting up a hire service business calls for good management and this requires accurate information that is easy to find when needed.

• When a business person keeps and uses records, s/he will:
  ➤ Know how much money s/he received, how much money s/he spent and how s/he spent it.
  ➤ Know how much of the inputs and materials are used to run the business.
  ➤ Know the charges set for hire services, their demand and the cost of machinery, equipment, inputs and materials.
  ➤ Be able to calculate whether s/he is making a profit or a loss.
  ➤ Be able to make better decisions on what services to provide.
  ➤ Be able to remember easily who owes him/her money and who s/he owes money to, so that people can not cheat.

• Business people often do not keep records because:
  ➤ They do not understand the importance of records.
  ➤ They do not know what records to keep or how to prepare them.
  ➤ They feel it is too complicated.
  ➤ They feel they do not have time.
Two volunteers perform the first role-play from hand-out 4.2. followed by a discussion around what happened in the play. Lead the discussion to the understanding that records would have removed the confusion.

Hire service providers share their experience with keeping and using records and discuss the importance of business records and what can go wrong if they are not kept. Lead the discussion to the relevant points in “key points to cover”.

Discuss why business people do not keep records. Lead the discussion to the relevant points in “key points to cover”.

1. The two volunteers perform the role-play.

2. When the play is done, discuss it; ask the following lead questions:
   
i. What happened in the role-play?

   *Answer: Jessica and Paul got into a fight over money because she did not believe what Paul told her about how he used the money earned from providing hire service.*

   II. Why Jessica did not believe her husband?

   *Answer: According to her the money was a lot and he could not have used it up so quickly.*

   III. What could have been done to avoid the confusion on how the money was spent?

   *Answer: Keep records.*

3. Ask the participants what constitutes record keeping? Why are records necessary?
Record keeping means writing down all the information that is important to your business. For example:

- How much money does your business receive?
- How much money does your business pay out?
- How much has been sold on credit?
- How much does your business owe?
- The value of equipment that your business buys.
- The money you invest in your business.
- Agreements and contracts between your business and your suppliers or customers.

4. Ask the participants which of them use records (of any kind). What kind of records do they use? Why do they use these records?

5. Discuss with the participants why it is important to keep records. What is the purpose of records? How can records help to better run the business? What can happen if records are not kept? Write their answers on the board.

Record keeping is necessary for every business. Neat, accurate records will help you to identify and solve problems. Use records to:

- Control your cash
- See how your business is performing
- Demonstrate to banks, investors, or other interested parties how your business is performing
- Plan for the future
6. Ask why some business people do not keep records. Lead the discussion to cover the points given in “key points to cover”.

7. Write True or False to the left of each statement below:
   i. Written records are only important to big businesses. In my business, I always remember all the transactions.
   ii. Business records are important for managing relationships with my suppliers and customers.
   iii. Keeping business records means only recording all the money that comes in or goes out of my business.
   iv. One of the most important reasons for businesses to keep records is to use them to identify problems with their businesses.
   v. Record keeping might be a legal requirement for your business.
Handout 4.2. Record keeping

Records are a critical part of any successful and profitable business. Without records, business people cannot evaluate, diagnose or properly plan their businesses. Records do not have to be sophisticated or complex, but they do have to record the information needed by business people in a way that is easy to use and understand.

How can records improve your business?

Neat, accurate records can help you to find out how your business is doing and to solve possible problems:

• If your business is doing well, use your records to identify the reason behind and to find things that you can do to make it even better.
• If your business is not doing well, use your records to identify the problems and then plan how to solve them.

Records are also important to manage relationships with different institutions and individuals that provide the services or manufacture the goods you need in your business. The contractual agreements you enter into are also part of your business records.

1. Records help you to control your cash.
   Your records show how much cash your business should have in hand at any point in time. Use your records to make sure that money does not disappear.

2. Records show you how your business is performing.
   Your records help you to identify problems before it is too late. Use your records to find out if something is wrong, if costs are too high, if sales are falling, etc.

3. Records show others how your business is performing.
   You need proper records to apply for a loan, to pay your taxes and for most business activities. Use your records to show that everything is in order and that you are in control of your business.

4. Records help you plan for the future.
   Records show how well your business did in the past and how well it is doing now. When you know your strengths and weaknesses, you can properly plan for the future.
The following three exercises explore the wisdom of keeping records and discuss the following types of records:

- Machinery operation records
- Labour records
- Cash inflow records
- Cash outflow records
- Profit and loss records
- Fixed asset records

This exercise is based on a role-play. Before doing the exercise, prepare two of the participants to perform the brief sketches presented in the boxes below.

**Role play 1: Argument between Paul and his wife Jessica**

Jessica: I need some money to buy a dress for Easter.
Paul: I have no money.
Jessica: What? We provided hire services to 10 farmers and managed to earn $150. How did it finished?
Paul: We spent the money on household needs and some was invested back into the business.
Jessica: You are lying: you must have eaten all the money. It was too much to get finished just like that.
Paul: You call me a liar?
Jessica: No, but just show me the records that prove you are not.
Paul: I can’t.
Jessica: Why?
Paul: I didn’t keep records.
Role play 2: Max and his banker

A. Max goes to see his banker and mentions he needs a new tractor. Max says he’s sure he’ll be able to repay the loan within 3 years. The bank manager says that before deciding they need to see Max’s sales and profits records and his plan for the future.

B. Max’s customer calls and says Max promised him a discount of 5% for the orders made in June that is why he made many orders. Max says this is not true and explains the discount was only for the first order made in June.

Do you think the bank gave Max a loan?

What should Max do to get a loan?

What was the problem with Max and his supplier?

What should Max have done to prevent the problem?

Do you have similar problems in your business? Do you know of any other business that has had similar problems? Were the problems solved? If so, how were they solved?

In most businesses there are so many transactions that business people cannot remember all of them. Written records of business transactions would help business people to avoid similar problems. This is the reason why businesses need to keep accurate records. Another reason is that in many countries the law requires it.

The bank did not give Max the loan. The bank needed to know how well his business had been doing, so they wanted to see his records on sales and profits. Had Max kept such records he would have been able to show the bank how well his business was doing and he would have been far more likely to get the loan approved.

Max and his supplier (?) had a problem of miscommunication about the discount programme. Had Max and his supplier signed a written contract, there would have not been any miscommunication.