

Module 6: Basic Knowledge Management and Extension



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In 2012 GFRAS developed the “New Extensionist” document, which details the role that extension plays in an agricultural innovation system, and the strategies and capacities needed (at individual, organisational, and system level) <http://www.g-fras.org/en/activities/the-new-extensionist.html>. Based on this document the GFRAS Consortium on Extension Education and Training emerged to promote the New Extensionist, mainly through training, curricula review, and research on extension.

The Learning Kit contains 13 modules designed for self-directed, face-to-face, or blended learning and can be useful resource for individual extension field staff, managers, and lecturers.

The Basic Knowledge Management and Extension module is developed as part of the New Extensionist Learning Kit <http://www.g-fras.org/fr/652-the-new-extensionist-core-competencies-for-individuals.html>.

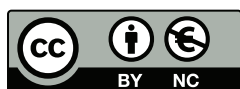
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1. Before you begin

1.1 General instruction

This module should be used in conjunction with the workbook provided. As you read through the module, you will find different visual features that are designed to help you navigate the document.



Figure 1: Icons used to highlight important information throughout the manual

The module makes use of keywords (difficult or technical words that are important for you to understand). To ensure that you receive the full benefit from the module, keywords will be marked the first time they occur and defined in a box containing the keywords symbol. Make sure that you read the definition of any words that you are unsure about.

1.2 Activities

Each session in the module will contain various types of activities to help you become knowledgeable and competent. The module contains three types of activities:

A **pre-assessment** is to be completed before reading through the module overview and introduction, and a **post-assessment** is to be completed once the entire module has been covered. This will measure the degree to which your knowledge has improved by completing the module.

Each session contains one or more **session activities** to be completed, in the workbook, where indicated in the module. These activities measure your ability to recall and apply theoretical knowledge.

At the end of each study unit a **summative assessment** needs to be completed. These assessments are longer than the session activities and will test your knowledge on all the work within the study unit.

1.3 Assessment instructions

Keep the following in mind before doing any of the assessments:

- All assessments are to be completed in the provided workbook.
- The manual contains all relevant information you will need to complete the questions, if additional information is needed, such as the use of online sources, facilities will be made available.
- Work through the activities in a study unit and make sure that you can answer all the questions before attempting the summative assessment. If you find that you are not certain of any part of the training material, repeat that section until you feel confident.
- The summative assessment must be done under the supervision of your trainer at the end of your learning period.

Module 6: Basic Knowledge Management and Extension

Study unit outcomes

After completing this study unit, you should be able to:

- Distinguish between and describe different types of knowledge relevant to agricultural extension and innovation;
- Describe the basics of knowledge management and the different intermediary roles needed to foster knowledge flow. Employ the most appropriate intermediary role for a particular situation; and
- Distinguish between different communication media and tools that can support knowledge management. Employ the most appropriate one for a particular situation.

Module overview

The success of agricultural innovation systems (AIS) are greatly dependent on effective **communication** of knowledge.



Communication:

The process of sharing information between individuals.

Knowledge:

The practical and theoretical understanding of a subject.

This module outlines the different types of **knowledge** that you as an extension agent will need to deal with as well as the different sources through which knowledge can be gained. You will learn that different situations may require you to take on different intermediary roles in order to facilitate the transfer of knowledge. This module also describes the different communication media and tools available to you to support your role in stimulating the flow of knowledge.

Module introduction

Extension from the perspective of the new extensionist has moved beyond a technology transfer **paradigm**, and is more broadly about enhancing different ways of fostering communication between relevant players (i.e. stakeholders, farmers and extension agents) in agriculture, in order to enhance knowledge sharing, learning and ultimately innovation in terms of practices and technologies.



Paradigm:

A way of thinking about a specific subject.

The nature of the knowledge generated by these different actors in the agricultural extension arena varies greatly. Extension agents should be able to aid the flow of a wide variety of knowledge between farmers, stakeholders and extensionists in the agricultural innovation system by using an appropriate mix of different methods and communication media. Extension agents should develop a diverse range of intermediary roles in order to manage the flow of knowledge in a way appropriate to a particular situation. They should also manage knowledge in such a way that they keep themselves up-to-date and deliver the best possible support to farmers.



Complete the pre-assessment in your workbook.

Study unit 1: Different types of knowledge

Study unit outcomes

After completing this study unit, you should be able to:

- Describe the different roles and forms of knowledge and their importance to agricultural innovation; and
- Explain and describe what this means for your work as an extension agent.

Study unit overview

As an extension agent you need to appreciate that innovation is a collective process. In order to make different changes in technologies, practices, habits and procedures, collective learning and the exchange of knowledge needs to take place. In this unit you will learn to appreciate that there are different forms and types of knowledge related to similar topics and issues.

You will also learn that knowledge can be obtained from different sources. These different types and forms of knowledge are complementary and as an extension agent you need to have an appreciation for this diversity. The way knowledge is communicated greatly influences the impact the knowledge has. In this unit, you will deepen your understanding of the relationship between knowledge and communication, and how that connects to **knowledge management**.

Knowledge management:

The process of capturing, developing, sharing, communicating and effectively using knowledge.



Study unit introduction

People differ in how they view the world, and the knowledge they have about the world is not always objective. The knowledge people use to inform their actions is frequently shaped by different social influences. These social influences include cultural diversity, different group identities and different **self-presentational** interests. Not only is knowledge shaped by social influences, the way that knowledge is gained leads to different types of knowledge. One of the main roles of an extension agent is the transfer and exchange of knowledge. In order to effectively communicate knowledge between the different players in the agricultural innovation system, you should be sensitive to the different types of knowledge that different people bring to the innovation and development community.



Self-presentational:

Any behaviour that attempts to convey some information or image of yourself to other people.

Session 1.1: Different types and sources of knowledge

Session outcomes

After completing this session, you should be able to:

- Distinguish between different types and forms of knowledge; and
- Describe the different sources through which knowledge is gained.

Introduction

In the simplest terms, knowledge is the way you understand and interpret the world around you. Knowledge is frequently broken down into different components namely: **data**, **information** and knowledge. Some examples of data include, prices, quantities, measurements and daily temperatures.

Data: Raw, unprocessed facts resulting from observation, experimentation or calculation.

Information: Data that has been given a meaning.

Hierarchical: Organised into different levels.



Information is data in context. In other words, it is data that has been processed, refined, interpreted and given a meaning. Knowledge is derived from information and, in combination with experience and insight, leads to wisdom. Wisdom, however, is a very difficult concept to define. Sometimes the components of knowledge are arranged in a pyramid to show the **hierarchical** relationship between data, information, knowledge and wisdom as seen in Figure 1.



Figure 1: The DIKW pyramid

Think about a practical example of data, information and knowledge.



While reading the newspaper you notice that the price of maize is \$400 per tonne (data). You decide to look in last month's paper and you see that the price of maize has risen from \$200 to \$400 per tonne (information). Thinking about the maize price increase, you realise that when maize prices go up it is likely that food prices will also rise (knowledge).

Different types and sources of knowledge

Knowledge can be gained in different ways and through different routes. Knowledge may be gained through observation and experience; this is referred to as **experiential knowledge**. Experiential knowledge can be gained through apprenticeships or in-house training programmes, but it does not necessarily happen through an institution.

Formal knowledge is obtained through scientific processes and involves theories and formulae that are usually found in textbooks and handbooks. Formal knowledge is normally presented by trained individuals in a systematic way within an institution of learning such as a school, college or university.

The different sources of knowledge also lead to the acquisition of different types of knowledge, namely explicit and **implicit knowledge**. **Explicit knowledge** can be written down in books, made visible, described and is easily captured in language. Explicit knowledge is mainly acquired through formal learning in schools or universities. Explicit knowledge, for example, is the knowledge that farmers are presented with during a course on integrated pest management.

Implicit or **tacit knowledge** is gained through **enculturation** and experiences within a specific socio-cultural environment. Tacit knowledge is complex and cannot be easily captured in language. This type of knowledge is often only found in the minds of people, is very specific to the situation people are in and is mostly gained through practical experience and non-formal learning. Implicit knowledge, for example, is the knowledge many farmers have about the best time to sow particular crops even if they are not able to explain the scientific basis for their knowledge.

Experiential knowledge: Knowledge gained through practice or experience. 

Formal knowledge: Knowledge obtained from an institution of learning.

Implicit/tacit knowledge: Knowledge that is not easily captured with language and usually resides in people's minds.

Explicit knowledge: Knowledge that can easily be made visible or written down.

Enculturation: The process by which a person learns about the values and norms of their culture.



Complete Activity 1.1 in your workbook.

Session 1.2: Communication to support appropriate flow of knowledge and learning

Session outcomes

After completing this session, you should be able to:

- Analyse the relationship between knowledge and communication; and
- Explain knowledge management.

Introduction

Communication is simply exchanging knowledge through information. In order to communicate knowledge, it has to be turned into information by the sender. Once the information reaches the receiver, it needs to be turned back into knowledge and interpreted. Communication is an important process used by people to exchange experiences and ideas, and is a vital trigger for altering different kinds of knowledge and perceptions.

What is knowledge management?

The creation and communication of knowledge has become very important in today's information age. Knowledge has become an important resource and can be viewed in some instances as a commodity. The growing importance of knowledge has led to the concept of knowledge management. Knowledge management is the process of capturing, developing, sharing, and effectively using knowledge. Extension manages knowledge in an agricultural innovation system to support the progress of farmers.

How are different forms of knowledge transferred, shared or combined?

Over the years different knowledge management models have been developed. The SECI (Socialisation, Externalisation, Combination, Internalisation) model is a knowledge management model that explains how the different forms of knowledge are transferred or combined in an organisation. The SECI model was the first widely accepted model of knowledge management and is also referred to as the Nonaka/Takeuchi knowledge spiral, named after the creators Ikujiro Nonaka and Hirotaka Takeuchi. Figure 2 shows this knowledge management model.

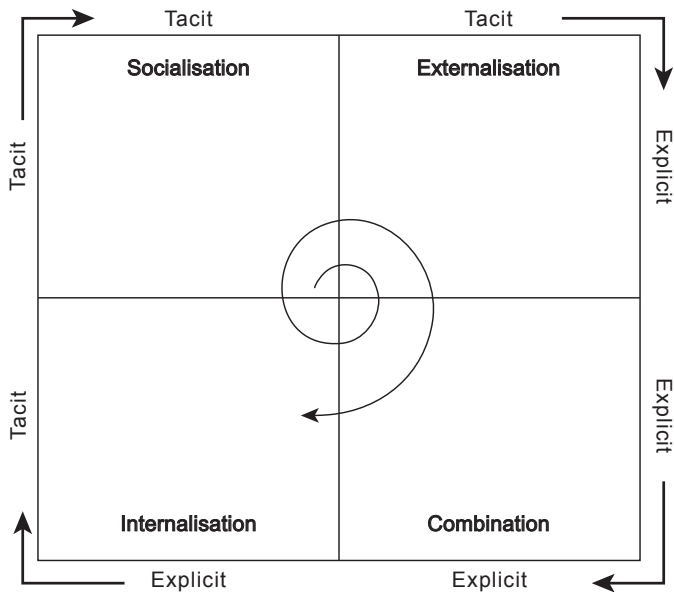



Figure 2: The SECI knowledge management model

Within this model there are four modes of knowledge conversion:

- **Socialisation (tacit to tacit):** Socialisation is when knowledge is shared through observation, imitation and practice. Practical examples include interaction between co-workers, teamwork, informal communication and verbal explanation of a task. However, the knowledge remains tacit;

- Externalisation (tacit to explicit): This process involves documenting tacit knowledge to make it interpretable and sharable. This process is a very important step in knowledge management, as tacit knowledge leaves when employees leave. A good example of externalisation is brainstorming between colleagues or physically demonstrating a task;
- Combination (explicit to explicit): This is the process of reorganising and combining knowledge to form new concepts. Some examples of this process include creating a database to update and organise knowledge, writing a review or creating training material; and
- Internalisation (explicit to tacit): Internalisation happens when an individual learns by repeating and practicing certain activities and applying explicit knowledge. The main process through which internalisation happens is learning by doing, in other words practicing a task repeatedly.

Look at a practical example of the SECI model in action.  You have just started working at a large, well-established dairy farm. On your first day, your supervisor gives you a tour of the whole farm (socialisation), after which you begin your training. During training, several of the experienced workers physically demonstrate how various equipment works (externalisation). These experienced workers have also collaborated and created various checklists for operating the machinery and the day-to-day operations of the farm (combination). For the first two weeks, you work under the supervision of a senior worker, practising and repeating all the things that were demonstrated to you (internalisation). After a couple of weeks, you are confident in your knowledge of how all the equipment works and the overall day-to-day operations and the workers on this dairy farm have successfully shared and transferred their knowledge.



Complete Activity 1.2 in your workbook.

Session 1.3: Innovation as a process of collective learning and knowledge exchange

Session outcomes

After completing this session, you should be able to:

- Explain that innovation is a process of collective learning; and
- Discuss the different areas of knowledge that are needed for innovation.

Introduction

Learning not only takes place when acquiring new knowledge, but also through the exchange of different types of knowledge or altering existing knowledge, perceptions and behaviours. An important part of innovation is the process of collective learning. In the agricultural extension environment, collective learning has to take place between the extension agent and the client and also between the extension agent and other players in the AIS. Collective learning involves exchanging different types of knowledge and the flow of knowledge through effective communication. Furthermore, innovation goes beyond merely transferring technical knowledge, but calls for the integration of different kinds of knowledge and skills that will influence the successful embedding of technologies.


Different areas of knowledge and competence needed for innovation

There are different areas of knowledge and competence needed for innovation to be successful. These areas are listed below:

- Issue-related knowledge: This is the knowledge of the characteristics and workings of different systems (**biotic**, **abiotic** and social). This includes background knowledge of the social, cultural, political and economic situation of an area.

A frequently overlooked area of issue-related knowledge is the implicit ideas and experience of the different stakeholders regarding various social and technical solutions;

- Knowledge about people and networks: In the AIS it is very important to have an understanding of who all the relevant role players are and what relationship exists between them. For example, knowledge about past or present collaborations or conflicts between different stakeholders will greatly influence the success of knowledge transfer and communication; and
- Social process knowledge: This is knowledge about different network building, social learning and negotiation processes in a specific area. A good example is how knowledge about local preferences regarding issues such as learning or conflict resolution will influence how new technologies are implemented.


Biotic: All the living things in the environment.
Abiotic: All the non-living things in the environment.



Complete Activity 1.3 in your workbook.

Concluding remarks

Knowledge plays a fundamental role in promoting innovation and the exchange of ideas. However, it is important to remember that knowledge is multi-perspective, context-specific and dynamic in nature. Agricultural innovation organisations need to manage knowledge effectively in order to use explicit and implicit knowledge fully. Multiple, simultaneous adaptations need to be made on farms to enable combined technological, social and institutional change and this may call for combining knowledge from different sources.



Complete the summative assessment in your workbook.

Study unit 2: Different communication models and the intermediary role of the extensionist

Study unit outcomes

After completing this study unit, you should be able to:

- Distinguish between the different models of communication; and
- Apply the right communication model for a particular issue at hand.

Study unit overview

Communication often does not have the anticipated outcome. As an extension agent you may think you delivered a message and transferred knowledge but it does not have the desired effect. In this study unit, you will learn about the different ways information goes from a sender to a receiver, and what problems may occur that prevent effective communication. Sometimes it is enough to provide technical information in a written form (giving explicit knowledge), and sometimes you need to engage in joint experimentation with the farmer and stimulate learning (stimulating tacit knowledge exchange). This study unit will help you understand that different issues at hand may need a different approach from an extensionist. You will learn that as an extensionist you are a knowledge manager for the farmer, ensuring he or she gets the appropriate knowledge in the appropriate form. You will also learn that as an extensionist you should have your own knowledge management system in order to stay informed of the latest developments in farming, and get the latest results from research.

Study unit introduction

Depending on the situation at hand, extensionists need to be able to choose the right way of communicating in order to get their knowledge across and achieve new knowledge construction and learning in the client. The form of communication and the role that the extensionist takes as an intermediary depends on the complexity of the situation. A straightforward query from a farmer about a well-defined issue or a minor technological improvement that requires few other adaptations in farming practices, may allow you to simply give the farmer a guideline. On the other hand, a complex change requires more effort to change views and perceptions of the problem and possible solutions. Complex changes frequently need different sorts of knowledge and joint learning to be combined. This module will build your awareness and knowledge about the range of intermediary roles an extensionist should master.

Session 2.1: Different communication models

Session outcomes

After completing this session, you should be able to:

- Describe the three main communication models; and
- Identify problems that prevent the effective communication of knowledge.

Introduction

Communication models are representations of how knowledge flows from a sender to a receiver. A communication model helps us to understand the communication process by breaking down the different parts of the communication process. Over the years, different communication models have been developed to explain how information is communicated.

Sometimes the message that you communicated does not reach the intended individual or does not have the planned outcome. Extension agents need to be able to identify possible problems that prevent a message or innovation from reaching the farmer.



Communication model:

A representation of how information is transferred from a sender to a receiver.

Three models of communication

As mentioned earlier, communication models help you to understand how communication works, how information is transmitted, and how this information is received and interpreted. In this section you will learn about three of the most common communication models.

The sender-oriented or transmission model is one of the simplest and earliest used communication models. You can see an example of this in Figure 3. In this model the sender (the information source) composes a message (information that needs to be communicated) and transmits it through a channel (communication device like a telephone) to a receiver. In theory, the sender and receiver will have identical information, unless something interferes with the message being carried through the channel (noise or distortion).

However, this communication model is a major over-simplification of the communication process. Even if nothing interferes with the transmission of the message, the differences in pre-existing knowledge between the sender and the receiver means that they rarely end up with the exact same meaning and information. In terms of extension, extension agents and farmers will always interpret information differently despite all efforts to communicate effectively.

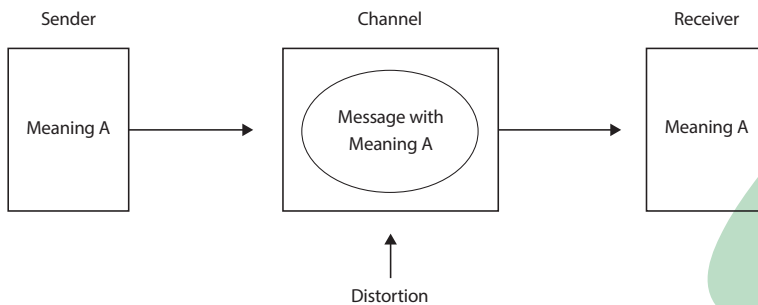


Figure 3: The sender-oriented or transmission model of communication

Receiver-oriented or subjective model takes into account that the sender and the receiver use a different frame of reference to interpret information. The sender encodes (composes) a message using their personal frame of reference. This message is transmitted and reaches the receiver, who uses a different personal frame of reference to decode (interpret) the message

as you can see in Figure 4. For effective communication to take place in this model, the sender has to consider the frame of reference of the receiver. Agricultural extension agents would therefore have to investigate the different perspectives of the farmers in detail in order to get their intended message across.

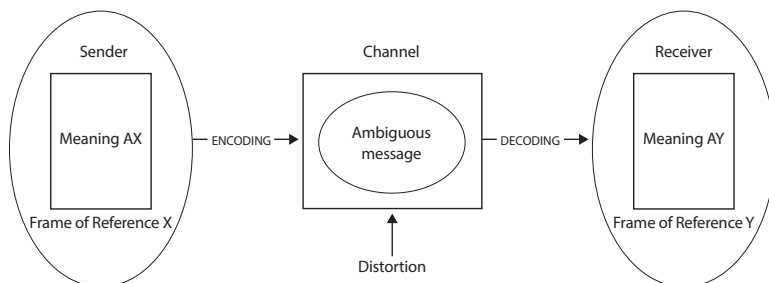


Figure 4: The receiver-oriented or subjective model

The social network or negotiation model is relatively new and improves on two important shortcomings of the previously mentioned models. Firstly, this model considers the influence of previous and other simultaneous communications within the wider environment of the sender and receiver. For instance, extension agents are usually not the only people communicating with farmers, they also come into contact with other people (other farmers, religious leaders, family, local elders, traders) who influence them. Secondly, this model recognises that the wider political and social environment of the sender and receiver will affect their interpretation of messages. Figure 5 shows a simplified representation of this communication model.



Communication

barrier: Any problem that prevents the flow of information between people.

Information overload or fatigue: The stress caused when someone receives more information than needed to make a decision or they are unable to interpret the information fully.

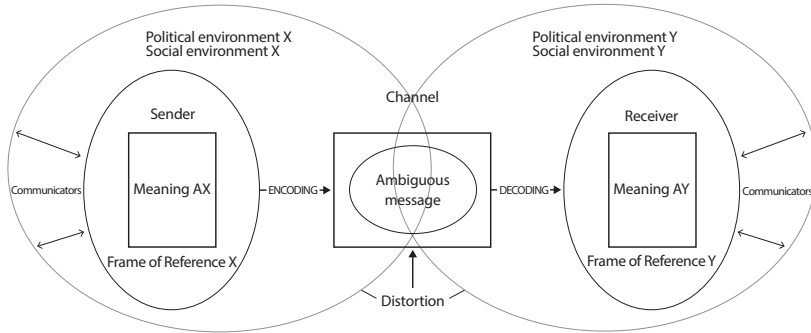


Figure 5: Social network or negotiation communication model



Complete Activity 2.1 in your workbook.

Problems that prevent effective communication

Communication barriers are problems or limitations that prevent the flow of information from a sender to the intended receiver. In the following section you will learn about several possible problems that may prevent the effective communication of intervention messages:

- The message never reaches the target audience. This problem frequently occurs when there is an inadequate choice of communication media. For instance, the extension agents broadcast a message on television in an area where very few people have access to television.
- The message reaches the target audience but they do not pay attention. This is often connected to **information overload** or **fatigue**. When innovation messages are designed without considering the educational background of the audience, it can lead to confusion or message overload. The target audience's attention can also waver when they are distracted by other concerns or physical needs that are not being met. For example, a hungry farmer will not pay attention

and will therefore not be able to completely implement a demonstrated innovation. Lastly, if the relationship between the communicating parties is strained (conflict or a lack of trust) the audience may choose not to pay attention to a message.

- The message is not understood or correctly interpreted. The main reason this problem occurs is incorrect message content. When extension agents design messages without considering the pre-existing knowledge of the target audience, they may use concepts, language or terminology that the audience is not familiar with.
- The audience disagrees with the message. If you fail to consider the target audience's interests, aspirations, beliefs or culture, they may doubt the validity or integrity of your message.
- The audience ignores the message. Even if they agree with the message, some people may choose to ignore it. This may simply be due to a shortage of starting material, for example, a farmer may lack the capital or labour to implement a change. However, this may also be connected to the audience's priorities, interests or pressures from the wider social or political environment.
 - The audience abandons the advice contained in the message. Even if the advice communicated is initially followed, some people may stop after a while. Based on their experience or a change in circumstances, the innovation no longer suits or benefits them.



Complete Activity 2.2 in your workbook.

Session 2.2: Adapting communication models and intermediary roles to levels of agricultural innovation complexity

Session outcomes

After completing this session, you should be able to:

- Explain that agricultural innovation has different levels of complexity;
- Describe the different communication styles and intermediary roles needed for different levels of innovation complexity; and
- Describe different knowledge exchange encounters within AIS.

Innovation

complexity: How easy or difficult it is to implement a specific innovation.

Incremental:

Increasing or adding on little by little.



Introduction

As an extension agent, you will learn that different issues at hand may need a different approach. Sometimes it is enough just to provide technical information in a written form (giving explicit knowledge), and sometimes you need to engage in joint experimentation with the farmer and stimulate learning (stimulating tacit knowledge exchange). The intermediary role you play and the

way you communicate knowledge will depend very much on the level of **innovation complexity**.

Innovation at an individual object or farming practice level usually involves minor change in current practices and technologies (**incremental** innovation). At this level, adopting innovation is relatively easy as technologies add value and are compatible with the current farming system. Innovations at this level are, for

example, a new piece of equipment or changing to a new crop variety or breed of cattle.

If innovations are more radical, and require major changes in the farming system or environment, the broader system which influences the farming system also needs to change (e.g. supply chain arrangements, regulations, and other farmer's systems). At the level of the farming system or farming environment, innovations typically involve changes to the whole system at various levels.

The more complex the level of innovation, the greater the need for assistance from different parts of the AIS. Adopting a minor change may only involve minimal decision time and the involvement of a few people. Complex changes will typically involve shared decision-making and the involvement of various role players in the AIS.

Different communication styles and intermediary roles needed in agricultural innovation


The communication style used by an extension agent is largely determined by the complexity of the innovation issue. If the issues at hand are well known and new knowledge is an addition to a lot of existing knowledge, straightforward knowledge transfer will work well. When issues are complex, communication should be interactive. Interactive communication is about listening and dialogue, avoiding misunderstandings and enhancing learning. In other words, to get a joint understanding of a complex innovation issue, there needs to be continuous interaction about the interpretation of information. Here tools such as joint experimentation or farmer field schools can be useful.

Likewise, different levels of innovation complexity require an extension agent to fulfil different intermediary roles. When issues are known and changes are minor, a sender-oriented approach can do (information intermediary), when they become more complex a dialogue between sender and receive is needed (knowledge broker and translator), and when problems transcend

the farm level but need changes from different players in the AIS a negotiation approach is needed (innovation broker). These intermediary roles can be portrayed by one or several individuals and the distinction between them is not always clear.

The different innovation intermediary roles and their roles are discussed below:

- When there is simply a need for access to information from different sources, information intermediaries enable the transfer of information from one source to another. Information intermediaries help gather and effectively transfer or exchange knowledge.
- A knowledge translator helps to make sense of, and interpret complex information and is involved in the translation and communication of knowledge and ideas.
- Knowledge brokers help to build relationships between knowledge producers and users and improve the use of knowledge in decision making processes. A knowledge broker is mainly involved in networking and facilitating knowledge exchanging events.
- Innovation brokers enable innovation and facilitate social learning. Through negotiation and collaboration, they create environments that are conducive to sustainable innovation.



Look at a practical example of how an individual can play different innovation intermediary roles. On a large research project about an improved maize variety, a research manager supervises the production of research (information intermediary). After the research has been published in an academic journal, the research manager writes a list of recommendations for farmers in more informal language (knowledge translator). After initial feedback from the farmers about this new maize variety, the research manager then works with researchers to develop a future research strategy that responds to local farmers' needs (knowledge broker). The research manager also ensures that a wide range of organisations contribute knowledge and invests funds in the project (innovation broker).

Different knowledge exchange encounters

The way knowledge is exchanged between an extension agent and farmer can vary depending on the requests for support and the way the farmer learns. An extension agent may choose to take either a more prescriptive or a more reactive role, or have a facilitative role in the knowledge exchange encounter:

- **Prescriptive knowledge exchange** encounters happen when the transfer of explicit knowledge is deemed appropriate. In this situation, extension agents are mostly proactive, knowledge generally flows one way and there is generally little interaction between the extension agent and farmer;
- **Reactive knowledge exchange** encounters happen when extension agents are called on to provide expert advice but they only provide answers to questions. In this situation, extension agents are mostly reactive with the majority of the demand and motivation coming from the farmer; and
- **Facilitative knowledge exchange** encounters are when the extension agent and the farmer form a partnership and combine their knowledge and experience to make decisions.



Prescriptive knowledge exchange: When an extension agent simply transfers explicit knowledge.

Reactive knowledge exchange: When extension agents are called on to only provide answers to questions.

Facilitative knowledge exchange: When an extension agent and a farmer form an interactive partnership to share knowledge.



Complete Activity 2.3 in your workbook.

Session 2.3: Extension as a knowledge management system

Session outcomes

After completing this session, you should be able to:

- Explain the importance of an extension agent as a knowledge manager; and
- Explain why it is important for extension agents to keep up-to-date with relevant knowledge.

Introduction

As an extension agent, you are a knowledge manager for the farmer, ensuring he or she gets the appropriate knowledge in the appropriate form. An extensionist should also have a personal knowledge management system, to ensure they stay informed of the latest developments in farming, and get the latest results from research in order to give the best advice.

Hub: An intermediary institution that coordinates different extension services.



Extension agent as a knowledge manager for others

Extension agents have to function as knowledge managers for farmers, managing networks of advisors and sources from the AIS and also act as a referral point for

farmers to other sources of information and support. Sometimes it can be the case that an extension agent does not have all the expertise needed to address a complex query. If that is the case, it is important to liaise with colleagues to create a network of complementary advice, or form a **hub**. A hub is an intermediary institution coordinating different extension services and its functions include:

- Centralisation of different services: A hub acts as a one stop shop for the delivery of different services to farmers;
- Assembling different technology and support services: A hub can stimulate and optimise the flow of knowledge by clustering different technology and support services to address common challenges, stimulate learning and optimise innovation; and
- Coordination and facilitation: The hub acts as a knowledge broker facilitating the interaction of different actors in the AIS, creating networks and connecting dispersed resources.

Extension agent as a knowledge manager for themselves

Extension agents also need a personal knowledge management system, to keep up-to-date with current knowledge in the AIS. For this purpose, you can look at four main avenues that you can use to optimise your skills and expertise:

- Extension agents can learn by exchanging knowledge with colleagues from the same organisation using databases to store knowledge, in-house training and face-to-face informal and formal teamwork;
- Extension agents can enhance their skills by interacting with the farmers, stimulating experiential learning (gaining implicit knowledge);
- Extension agents can also learn by forming networks with colleagues from other organisations; and
- Extension agents can gain knowledge through direct interaction and cooperation with researchers.



Complete Activity 2.4 in your workbook.

Concluding remarks

The communication of knowledge is one of the major aspects of agricultural extension. In this unit you have learned that there are different models of communication and that using the appropriate communication model will greatly enhance the success of an innovation strategy. Even if the correct communication model is used, problems still occur that prevent the successful communication of knowledge. You have learnt about some of the main problems that could prevent effective communication in the extension environment and about the importance of being aware of these problems.

The way knowledge is communicated also depends on the situation. In the agricultural extension environment, your communication style will vary depending on the level of complexity of a particular innovation. Extension agents should also be aware that different situations will require them to perform different innovation intermediary roles. Finally, extension agents should strive to communicate the latest up-to-date information to farmers.



Complete the summative assessment in your workbook.

Study unit 3: Communication media and tools to support knowledge management

Study unit outcomes

After completing this study unit, you should be able to:

- Identify different communication media and tools that are available for knowledge management; and
- Choose the appropriate communication media and ICT tools for a specific situation.

Study unit overview

Communication media are devices that use a combination of different kinds of communication channels to transmit information. This unit will provide an overview of the range of communication media and tools available to you to manage knowledge transfer and exchange. Different communication media and what purpose they can be used for will be discussed.

Extension agents also need to familiarise themselves with modern information and communication tools (ICT) and how they can enhance rapid and cost-effective transfer and sharing of knowledge. This unit will look at some of the modern ICT tools available to extension agents and farmers.

Study unit introduction

An important part of knowledge management is the effective communication of knowledge. In order to communicate knowledge in such a way that the farmer is best supported, extension agents need to make use of several communication media and tools.

Conventional communication media include verbal, written, visual, **tactile** and **olfactory** communication. However, the rapid

development of ICT technology has led to the creation of new media. New communication media combines different parts of conventional media and communicates knowledge in unique new ways. These new ICT and mobile supported applications increasingly enable knowledge transfer and sharing. Different communication media all have their own merits and limitations. Depending on a specific situation, extension agents need to be able to determine an appropriate mix of media and tools to support effective communication between different role players of the agricultural innovation system.



Tactile:

Relating to the sense of touch.

Olfactory:

Relating to the sense of smell.

Session 3.1: Different forms of communication media

Session outcomes

After completing this session, you should be able to:

- Compare and discuss the merits and limitations of mass media and interpersonal media; and
- Use different forms of communication media and tools.

Introduction

Different communication media and tools serve different purposes. The choice of communication media, for example, depends on whether a situation calls for communication of explicit knowledge, sharing of tacit knowledge, or converting tacit knowledge into explicit knowledge. Before you learn about the different communication media further, it is important to distinguish between **synchronous** and **asynchronous communication**. When both communicating parties are involved in the process at the same time and can react to each other immediately, synchronous communication takes place. Synchronous communication takes place when people talk to each other face-to-face or over the telephone. On the other hand, asynchronous communication takes place when communicating parties are involved in the process of communication at different times and cannot respond to each other immediately. Asynchronous communication takes place when people communicate through newspaper articles, letters and emails. Today, there is a wide variety of different communication media available and they can be roughly divided into traditional mass media and interpersonal media.



Synchronous communication: When communicating parties are involved in the communication process at the same time and can react to each other immediately.


Asynchronous communication: When communicating parties are involved in the communication process at different times and cannot respond to each other immediately.

Mass media and interpersonal media

Mass media includes newspapers, radio and television. The sender can reach a large number of people over a long distance without direct interaction. Therefore traditional mass media is asynchronous. Interpersonal media is a more direct, synchronous process with the sender engaging with the audience directly and actively. Both mass media and interpersonal media have merits and limitations. Depending on the situation one may be better than the other. If an extension agent wants to communicate a message in an area where literacy rates are low, written mass media would not attract the attention of the target audience and therefore the message may be ignored. In this instance, it would be better to use interpersonal media such as group demonstrations. On the other hand, if an extension agent wants to communicate a message to a community that has a good literacy rate but struggles to schedule a meeting with all the key role players, written mass media would be better suited. Table 1 shows the main merits and limitations of mass and interpersonal media.

Table 1: Comparison of the main merits and limitations of mass and interpersonal media

| Mass media | Interpersonal media |
|---|--|
| High potential to reach a large target audience | Limited potential to reach a large target audience |
| Relatively high potential to attract attention to an issue | Relatively low potential to attract attention to an issue |
| Asynchronous communication | Synchronous communication |
| Relatively non-specific message | Relatively specific, tailor-made message |
| Differential spatial flexibility | High spatial flexibility |
| Differential time flexibility | Time flexibility within limits |
| Relatively low cost | Relatively high cost |
| High storage capacity | Low storage capacity |
| Low potential to stimulate experiential learning | High potential to stimulate experiential learning |
| Low potential to develop personal relationship with target audience | High potential to develop personal relationship with target audience |

Spatial flexibility: The possibility to adjust the physical environment in which a message is delivered to the preferences of a specific target audience. 

Time flexibility: The time that the message is received by an audience can be adjusted to suit the preference of the audience.

Storage capacity: The ability to store a message and receive it again at a later stage.

Different forms of communication media

There is a wide variety of communication media available, which can roughly be divided into written, visual, verbal, tactile and olfactory communication.

Written communication can be used to communicate explicit knowledge and suit the information intermediary and knowledge translator roles well. Examples of written media include newspaper articles, leaflets, technical notes, guides, brochures and factsheets.

Verbal communication can be used to communicate explicit and implicit knowledge to groups or individuals. Verbal communication media can be more or less interactive depending on whether you use interpersonal or mass media. Examples of verbal communication include presentations to groups, group discussions, multi-stakeholder platforms, interactive theatre, one-on-one discussions and rural radio.

Visual communication is particularly useful for explaining complex ideas since it is easier to communicate some knowledge through images. Examples of visual communication include training videos, participatory videos, television shows and posters.

Tactile and olfactory communication enhances experiential learning through the use of other senses. Farmers can see the effect of treatments on plants and animals. Examples of tactile learning include field visits and field schools.



Complete Activity 3.1 in your workbook.

Session 3.2: Using ICT to enhance knowledge management

Session outcomes

After completing this session, you should be able to:

- Describe the use of different modern ICT media tools; and
- Discuss the merits and limitations of using modern ICT media in agricultural extension.

Introduction

Computer technology has led to communication media that combines some of the properties of mass media and interpersonal media. This hybrid media has the potential to reach a large target audience but at the same time it can be more interactive than traditional mass media. These modern communication media or ICTs have become widely used tools for both extension agents and farmers. Modern ICTs include devices such as mobile phones, tablets and laptops. These media enable new ways of virtual knowledge transfer and sharing. Their increased affordability and availability have made them a cost-effective option for farmers, even in resource poor regions. As an extension agent, it is important that you use these media to transfer knowledge and enhance learning, but also to know their limitations.

Different forms of modern ICT media

Sharing or collaboration platforms are online inter-connected spaces where different people from different locations can interact in the same space. They are particularly useful when groups of people, in the same or different locations, need a centralised space to plan strategies, share documents and interact with each other. Examples include file sharing, platforms, e.g.

dgCommunities (<http://topics.developmentgateway.org/index.do>), DGroups (<http://www.dgroups.org/>).

Social media platforms are web-based electronic communication tools that allow users to interact with each other, create, share, retrieve, and exchange information in a more informal and personal way. They are very useful to customise innovation messages to a very specific group or need. Examples include social networking sites (e.g. Facebook, Myspace or LinkedIn). These allow people to talk about new ideas and learn using resources, photos, videos, or links to websites. Tools such as blogging (Blogger, Wordpress) and **microblogging** (Twitter), video (YouTube) and image (Flickr, Instagram) sharing platforms allow people to create and distribute content. Feeds (e.g. Google News, AgriFeeds), tagging and social bookmarking tools (Delicious, StumbleUpon) allow people to use, organise and reuse content created and shared by others on the web.



Microblogging:

Communicating in short and frequent posts using an interactive online communication medium.

Mobile phone applications can refer to both smartphones (iPhone, Blackberry, Android phones) or simple low-tech cell phones with only voice dialing and texting functions. Mobile phone applications are especially useful in rural areas where reliable Internet connections are not always available or other ICTs are not a viable option. Examples include dedicated agricultural

apps, mobile functions (m-functions) such as m-banking and WhatsApp groups.

Comparison of ICTs and traditional communication media

Modern ICT media is a mix of mass media and interpersonal media and it has a combination of some of the limitations and merits of these traditional media. Their novelty also leads to some new limitations, namely:


- **Insufficient connectivity:** Most modern ICTs need reliable and relatively fast Internet connections and many resource poor and rural areas lack such connectivity;
- **Limited access to hardware tools:** Many farmers and extension organisations may lack the capital needed to invest in ICT hardware such as smartphones, tablets or laptops; and
- **Cultural barriers:** Certain cultural barriers such as the age of farmers may prevent the optimal use of modern ICT tools and applications.

Table 2 compares modern ICT and traditional communication media.

Table 2: Comparison of modern ICT media with traditional communication media


| Comparison with mass media or interpersonal media | |
|--|--|
| Potential to reach a large target audience | Similar to mass media |
| Potential to attract attention to an issue | Similar to mass media |
| Asynchronous/synchronous | Can be both depending on specific tools |
| Specificity of message | Inbetween mass media and interpersonal media |
| Spatial flexibility | Similar to mass media |
| Time flexibility | Similar to mass media |
| Relative cost | Inbetween mass media and interpersonal media |
| Storage capacity | Similar to mass media |
| Potential to stimulate experiential learning | Inbetween mass media and interpersonal media |

| Comparison with mass media or interpersonal media | |
|---|--|
| Potential to develop personal relationship with target audience | Inbetween mass media and interpersonal media |

 Complete Activity 3.2 in your workbook.

Concluding remarks

In previous study units you have learned that the choice of communication media can affect the success of an intervention. In other words, the way you communicate a message to farmers is almost as important as the innovation message itself. In this study unit you briefly looked at the communication media and tools available to you as an extension agent. Apart from conventional communication media, this module also gives an overview of modern ICT tools and application. Limitations such as availability, affordability and connectivity prevent the use of some ICT tools and applications in certain resource poor regions. However, these media are becoming increasingly affordable and allow for fast and cost-effective communication and interaction between the different parts of the AIS. This is by far not an exhaustive list of all the methods and tools available, as today's rapidly evolving communication technologies are constantly creating new and exciting ways to transfer and exchange knowledge.

 Complete the summative assessment in your workbook.

 Complete the post-assessment in your workbook.

Glossary

Definitions

| Word | Definition |
|----------------------------|---|
| Abiotic | All the non-living things in the environment. |
| Asynchronous communication | When communicating parties are involved in the communication process at different times and cannot respond to each other immediately. |
| Biotic | All the living things in the environment. |
| Combination | The process of reorganising and combining knowledge to form new concepts. |
| Communication | The process of sharing information between individuals. |
| Communication barrier | Any problem that prevents the flow of information between people. |
| Communication media | Devices that combine different communication channels to transmit information. |
| Communication model | A representation of how information is transferred from a sender to a receiver. |
| Data | Raw, unprocessed facts resulting from observation, experimentation or calculation. |
| Enculturation | The process by which a person learns about the values and norms of their culture. |
| Experiential knowledge | Knowledge gained through practice or experience. |

| Word | Definition |
|---------------------------------|--|
| Explicit knowledge | Knowledge that can easily be made visible or written down. |
| Externalisation | The process of documenting tacit knowledge. |
| Facilitative knowledge exchange | When an extension agent and a farmer form an interactive partnership to share knowledge. |
| Formal knowledge | Knowledge obtained from an institution of learning. |
| Hierarchical | Organised into different levels. |
| Hub | An intermediary institution that coordinates different extension services. |
| Implicit/tacit knowledge | Knowledge that is not easily captured with language and usually resides in people's minds. |
| Incremental | Increasing or adding on little by little. |
| Information | Data that has been given a meaning. |
| Information intermediary | A person who enables access to information from different sources. |
| Information overload/fatigue | The stress caused when someone receives more information than needed to make a decision or they are unable to interpret the information fully. |
| Innovation broker | A person who enables innovation and facilitates social learning. |
| Innovation complexity | How easy or difficult it is to implement a specific innovation. |

| Word | Definition |
|---------------------------------|---|
| Internalisation | When an individual learns by repeating and practicing certain activities applying explicit knowledge. |
| Knowledge | The practical and theoretical understanding of a subject. |
| Knowledge broker | A person who builds relationships between knowledge producers and users and improves the use of knowledge in decision making processes. |
| Knowledge management | The process of capturing, developing, sharing, communicating and effectively using knowledge. |
| Knowledge translator | A person who helps to make sense of, and interpret complex information. |
| Microblogging | Communicating in short and frequent posts using an interactive online communication medium. |
| Olfactory communication | Communication through the sense of smell. |
| Paradigm | A way of thinking about a specific subject. |
| Prescriptive knowledge exchange | When an extension agent simply transfers explicit knowledge. |
| Reactive knowledge exchange | When extension agents are called on to only provide answers to questions. |
| Self-presentational | Any behaviour that attempts to convey some information or image of oneself to other people. |

| Word | Definition |
|---------------------------|--|
| Socialisation | When knowledge is shared through observation, imitation and practice. |
| Spatial flexibility | The possibility to adjust the physical environment in which a message is delivered to the preferences of a specific target audience. |
| Storage capacity | The ability to store a message and receive it again at a later stage. |
| Synchronous communication | When communicating, parties are involved in the communication process at the same time, and can react to each other immediately. |
| Tactile communication | Communication through the sense of touch. |
| Time flexibility | The time that the message is received by an audience can be adjusted to suit the preference of the audience. |

Abbreviations

| Abbreviation | Description |
|---------------------|--|
| AIS | Agricultural Innovation Systems |
| ICT | Information and Communication Technologies |

Resources

The following resources were used in writing this manual:

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- <http://www.slideshare.net/smtcd/knowledge-management-31651348>
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- <http://www.kstoolkit.org>

Other modules of the New Extensionist modules are:

1. Introduction to the New Extensionist
2. Extension Methods and Tools
3. Extension Programme Management
4. Professional Ethics
5. Adult Education for Behavioural Change
- 6. Basic Knowledge Management and Extension**
7. Facilitation for Development
8. Community Mobilisation
9. Farmer Organisational Development
10. Value Chain Extension
11. Agricultural Entrepreneurship
12. Gender in Extension and Advisory Services
13. Risk Mitigation and Adaptation

Other related modules developed by GFRAS are on:

- Evaluation of Extension Programmes
- Policy Advocacy for RAS