

# Malawi Primary Teacher Education

## Agriculture

### Module 1



Malawi Institute of Education

# **Initial Primary Teacher Education**

## **Agriculture**

### **Module 1**

**Malawi Institute of Education**

**Prepared and published by**

Malawi Institute of Education  
PO Box 50  
Domasi Malawi

email: [miedirector@sdp.org.mw](mailto:miedirector@sdp.org.mw)

website: [www.mie.edu.mw](http://www.mie.edu.mw)

© Malawi Institute of Education 2017

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form by any means, electronic, mechanical, photocopying, recording or otherwise, without the permission of the copyright owner.

First edition 2017

## **Foreword**

Education is the lifeblood of the nation. It is a prerequisite for individual, community and national development. Education prepares learners to play their roles effectively in efforts to promote and sustain a country's socio-economic development. Parents or guardians desire that their children develop into adults with sound minds and healthy bodies, through the acquisition of appropriate knowledge, skills and desirable attitudes to enable them to live productive and happy lives.

Education should, therefore, help learners to develop high standards of conduct, attitudes, judgment and a sense of responsibility. Student teachers have to be well prepared in order to be able to take this responsibility of teaching children effectively.

The provision of quality education is based on many factors and a good quality of teachers is one of them. Teachers play a central role because they are the key source of knowledge, responsible for facilitating the learning process and act as role models for the learners.

The function of initial teacher education in Malawi is to prepare student teachers in their aspiration of becoming teachers of high quality. This is achieved by helping the student teachers to acquire the right knowledge, skills and competences to enable them to effectively teach children. In view of this, the Initial Teacher Education curriculum has been reviewed to ensure that student teachers who graduate from this programme are well trained and prepared for their profession.

The process and implementation of this review has been guided by the Teacher Education Philosophy which states as follows:

*'To produce a reflective, autonomous, lifelong learning teacher, able to display moral values and embrace learners' diversity.'*

It is therefore hoped that Teacher Training Colleges will find this curriculum effective in helping the student teachers to build a solid foundation in their teaching profession.

Executive Director  
**Malawi Institute of Education**

## Acknowledgements

The Ministry of Education, Science and Technology and the Malawi Institute of Education would like to thank all people who participated in various activities, stages and levels in the development of this module.

Special thanks go to the Director of the Directorate of Inspectorate and Advisory Services (DIAS), Mr Raphael Agabu and his staff, the Executive Director of Malawi Institute of Education, Dr William Susuwele-Banda and his staff, Coordinator of the Initial Primary Teacher Education (IPTE) review process, Dr Ezekiel Kachisa and his team (Mr Edward G Mtonga and Ms Catrin Anderer) for coordinating the process of developing the module.

The Ministry of Education, Science and Technology and the Malawi Institute of Education would also like to thank Edward Gobede Mtonga, Lazarus Banda, Veronica Kaunda, Cosmas Goliati, Ruth Sambaleni-Nambuzi, Davie Kaambankadzanja, Dr Sarah Roelker, Laurent Afonso and Nthony Manja for reviewing the module.

The Ministry of Education, Science and Technology acknowledges technical and financial support which was generously provided by German Technical Cooperation (GIZ), United Nations Children's Fund (UNICEF), Food and Agriculture Organisation (FAO) and Open Society Foundation (OSF).

### Production team

Editing	Anthony Malunga
Designer	Doreen Kachala-Bato
Editor-in-chief	Max J Iphani

## **Writers**

Rhana C Kapito Mndala  
Tadeus B Ssdoya  
Yoas T Kamangira  
FON Macheke Chisale

Machinga Teachers Training College  
Chiradzulu Teachers Training College  
Domasi College of Education  
Lilongwe Teachers Training College

## Contents

Acknowledgements .....	
Foreword .....	
Introduction to the module .....	
<b>TOPIC 1</b> Familiarisation with core-elements and rationale for teaching agriculture .....	1
<b>TOPIC 2</b> Teaching of agriculture .....	6
<b>TOPIC 3</b> Teaching of agricultural environment and climate change .....	12
<b>TOPIC 4</b> Teaching of farm records .....	20
<b>TOPIC 5</b> Teaching of irrigation.....	27
<b>TOPIC 6</b> Establishing a school garden as a teaching, learning and assessment resource .....	32
<b>TOPIC 7</b> Teaching of arable crops .....	38
<b>TOPIC 6</b> Teaching of poultry production.....	44
<b>TOPIC 10</b> Teaching of pig production.....	52

## Introduction

The purpose of primary teacher education is to produce and continually develop competent and responsive teachers who effectively deliver quality education to all

learners under prevailing conditions and demands in primary schools and promote their desire for life-long learning. IPTE endeavors to educate teachers in sufficient numbers, continually develop their professionalism so that they are able to effectively and efficiently deliver quality and relevant education to primary school learners.

### **National goals for primary teacher education**

The national goals of primary teacher education in Malawi are to produce teachers who are:

- academically well-grounded and professionally competent
- flexible and capable of adapting to the changing needs and environment of the Malawian society
- capable of adhering to and maintaining the ethics of the teaching profession imaginative in adapting, creating and utilising locally available resources suitable for the needs of their learners

### **Rationale**

Foundation studies will equip student teachers with the necessary knowledge, skills and attitudes to carry out their role of facilitating learning of the primary school child. To teach effectively, student teachers must study the origins and development of the primary school curriculum and understand their role in its implementation through appropriate management of the teaching, learning and assessment processes at school level.

### **Teacher education philosophy**

The following has been the guiding principle during the design, development and implementation of the IPTE curriculum.

*To produce a reflective, autonomous, lifelong learning teacher, able to display moral values and embrace learners' diversity has been designed.*

### **IPTE programme structure**

The duration of the teacher education is two years. The general outlook of the two years is as follows:



Year 1			Year 2		
Term 1	Term 2	Term 3	Term 1	Term 2	Term 3
In college, learning subject content with a special focus on methods for lower classes	In college, learning subject content with special focus on methods for upper classes	Out in teaching practice schools, practising teaching mainly in the lower classes	Out in teaching practice schools, practising teaching mainly in the upper classes	In college, with special emphasis on reflection, inclusion and further practice on teaching methods	In college, with special emphasis on subject content, policies and frameworks

### Unique features

The features of the reviewed curriculum are as follows:

- The curriculum design is based on reflective and practice principles.
- Early grade teaching methodologies are distinct.
- The delivery of the subject content follows the modular approach.
- Student teachers will be allowed to practise teaching both in the lower classes (Standards 1 to 4) as well as in upper classes (Standards 5-8).
- Cross cutting issues such as Assessment for Learning, ICT, IE and CT are integrated.

### IPTE subject matrix

The new curriculum has adopted the reflective practitioner model of teacher education which connects practice and theory and integrates content and pedagogy in teaching and learning. In this structure, student-teachers will be in college for two terms of year 1 and be in primary schools for teaching practice in the third term of first year and first term of the second year. Student teachers will be back to colleges in terms 2 and 3 of year 2 to continue learning subject content, reflecting on their experiences of teaching practice and then wind up their studies.

This curriculum is designed in a modular structure and contains eleven subjects. These are Chichewa, English, Mathematics, Education Foundation Studies, Agriculture, Social Studies, Life Skills, Science and Technology, Expressive Arts, Religious Studies and Human Ecology. In this modular design, a set of topics forms a module in a subject. A module consists of 40 hours contact time.

Summary of topics for the term and time allocation

<b>Term 1</b>		
<b>Topic</b>	<b>Allocated time in hours</b>	<b>Core element</b>

**TOPIC 1****Familiarisation with core-elements and rationale for teaching agriculture**

**Time** 2 hours

**Term** 2

**Introduction**

Teachers must be familiar with both IPTE and primary school syllabuses. This is vital as it assists them in proper planning as well as the teaching of primary school learners.

An improvement in agricultural production will provide an opportunity for improving food security and creating wealth. As an agriculture teacher, you need to justify the teaching of agriculture in the primary schools. This will make the learning of agriculture relevant to learners.

In this topic you will analyse the link between each core-element to its outcome and learn how to teach the rationale for teaching agriculture in primary schools and teacher training colleges. This will help you to effectively establish the importance of the subject to the learners.

**Success criteria**

By the end of this topic you must be able to:

- relate core-element to its outcomes
- establish the importance of teaching agriculture

**Background information**

The IPTE agriculture syllabus has six core-elements. Each core-element has its own outcome describing knowledge, skills and competences to be displayed by lectures after going through the core-element.

**Why teach agriculture?**

In teacher training colleges agriculture is taught to prepare the teachers to acquire knowledge, pedagogical skills and develop positive attitudes towards the teaching of agriculture. This will help the teacher to use appropriate teaching, learning and assessment methods and resources in primary school.

Teaching of agriculture in primary schools will help learners to be prepared for further studies in secondary schools and for their survival at home. However, most agriculture teachers are faced with challenges of negative attitude towards the subject, inadequate resources, lack of creativity in using available resources for practical lessons and teaching the subject for examinations.

## Tasks

### Task 1 Relating core-element and its outcome

It is important to understand the link between core-elements and their outcomes. In this task, you will relate each core-element to its outcome.

#### Activity 1 Identifying core-elements

- 1 Brainstorm the meaning of the terms “core-element” and “outcome”.
- 2 Identify core-elements and outcomes in the IPTE syllabus.
- 3 Present your findings.

#### Activity 2 Relating the core-elements to their outcomes

- 1 Analyse the relationship between each core-element and its outcome.
- 2 Present your findings

### Tips

- For Activity 1, ensure that you have both IPTE and primary agriculture syllabuses.
- You may consider using strategies such as bus stage, Jigsaw and work station
- For Activity 2, you may consider using agriculture syllabus and IPTE training manuals.

### Task 2 Establishing the importance of teaching agriculture

In order to justify the teaching of agriculture in primary schools and teacher training colleges different approaches are used. In this task you will use research and discussion to explain the meaning and importance of teaching agriculture.

#### Activity 1 Introducing the meaning of terms in agriculture

- 1 Discuss how you would introduce the meaning of terms in “agriculture” to learners in primary school using the following methods:
  - a card collecting and clustering
  - b substitution table
- 2 Apart from those discussed in 1 what other methods can you use?
- 3 Present your findings for discussions

#### Activity 2 Teaching the meaning of agriculture

- 1 Write the meaning of agriculture on cards.
- 2 Collect them and group them to identify key words
- 3 Formulate the meaning of agriculture using the given substitution table

<i>Agriculture is the</i>	<i>practice</i>	<i>of growing crops and</i>	<i>rearing</i>	<i>animals on land for</i>	<i>people's enjoyment</i>
	<i>art</i>		<i>keeping</i>		<i>people's use</i>
	<i>job</i>		<i>raising</i>		<i>people's benefit</i>
	<i>science</i>				

4 Explain the importance of agriculture to:

- the individual
- families
- the community
- the nation

### Activity 3 Researching on the rationale for teaching agriculture

- Research on the rationale for teaching agriculture.
  - at primary school level
  - at teachers education level
- Compare and contrast the two rationales for teaching agriculture in primary schools and teacher training colleges.
- Share the findings in a plenary.

### Activity 4 Discussing the importance of teaching agriculture

- Discuss how agriculture can:
  - enhance well-being (good health) of people,

- lower absenteeism or increase attendance in schools,
- promote gender equality
- create a generation of healthy children
- enhance resilience to effects of climate change and natural disasters
- promote environment and natural resource management
- improve food security in the homes

2 Present your findings for discussion.

### Activity 5 Discussing crop and livestock products

- Identify crop and livestock products.
- Suggest linkage of products to the learning of agriculture.

#### Tips

- For activity 2 you may use agriculture IPTE and primary school syllabuses and teachers' guides
- You may use methods such as card collecting and clustering, KWL, give one take one, walk around talk around, work stations, panel discussion, one stay three stray, jigsaw.

### Summary

In this topic you have learnt about the relationship between core-element and its outcome and rationale for teaching agriculture.

There are six core-elements in the IPTE agriculture syllabus. These are teaching agricultural environment and soil science; teaching agribusiness; teaching farm tools, machinery and technology; the teaching of crop production practices; teaching livestock production practices and teaching agroforestry practices. The core-elements are associated with their outcomes that teachers must understand.

You have also learnt that teaching and learning of agriculture involves knowledge and skills in crop, livestock and environmental management for food and income. It is important to teach agriculture as it prepares learners for further education and occupation in agricultural production or processing. It also helps learners to understand their environment and manage it in a profitable and sustainable way through growing of crops and rearing of livestock.

## Reflection

- 1 Are the outcomes in the syllabus related to the core-elements?
- 2 Do you find the teaching of agriculture in teacher training colleges and primary schools important?
- 3 What were the successes in this topic?
- 4 What challenges did you face in this topic?
- 5 What should you do to address the challenges?

## Assessment

1. Why is it important for teachers to understand both IPTE and primary school syllabus?
2. Explain the link between “The teaching of Agribusiness” and its outcome.
3. Describe three ways in which the meaning of agriculture can be introduced to learners?
4. How can the local environment be used to emphasize the importance of teaching agriculture in primary schools?
1. How can the teaching of agriculture contribute to economic development in Malawi?
2. Describe the importance of teaching agriculture in:
  - a. primary schools.
  - b. Teacher training colleges.

## Glossary

**Resilience:** The capacity to recover quickly from hardships; toughness.

## References

- Malawi Institute of Education (2005). *Primary school syllabus for agriculture ;* Domasi, MIE
- Malawi Institute of Education (2007). *Malawi primary school agriculture teachers' guides for standard 5,* Domasi: MIE.
- Malawi Institute of Education (2008). *Initial primary teacher education agriculture tutors' book:* Domasi, Malawi

Malawi Institute of Education (2008). *Initial primary teacher education agriculture students' book*: Domasi, Malawi

Malawi Institute of Education (2010). *Initial primary teacher education ODL agriculture module 1*: Domasi: MIE.

Malawi Institute of Education (2013). *Critical thinking sourcebook for Malawi*, Domasi: MIE.

Malawi Institute of Education (2014). *Ways of teaching and ideas for student teachers*. Zomba: MIE.

Malawi Institute of Education (2015). *Critical thinking training manual for Malawi*. Domasi: MIE.

Malawi Institute of Education (2017). *Initial primary teacher education syllabus for agriculture*: Domasi, MIE

## TOPIC 2

## Teaching of agriculture

**Time** 3 hours

**Term** 2

### Introduction

In topic 1, you learnt about the importance of teaching agriculture in primary schools and teacher training colleges. To teach agriculture, effectively you must prepare schemes of work; lesson plans; teaching, learning and assessment resources. This will help you to deliver lessons which are logical and meaningful.

In this topic you will develop schemes of work, demonstrate and apply different approaches for teaching and assessing learners' work. You will also analyse strengths and challenges in the teaching of agriculture.

### Success criteria

By the end of this topic you must be able to:

- develop sample schemes of work for agriculture lessons
- demonstrate different approaches for teaching agriculture
- analyse different challenges in the teaching of agriculture
- apply appropriate ways of assessing learners' performance in agriculture

### Background information

Teaching agriculture requires development of schemes of work from approved syllabus. Different teaching,

learning and assessment approaches have already been suggested in the syllabus. It is the duty of the teacher to use some of the suggested methods and activities and even be creative enough by adding more in order to achieve the intended learning outcomes.

As a practical subject, teaching of agriculture faces challenges of large classes, meeting needs of diverse learners, limited assessment of practicals and use of Information Communication Technology (ICT). Proper planning for teaching is helpful as it ensures full coverage of desired key knowledge, skills and development of teaching, learning and assessment attitudes. It also helps to prepare of resources and proper timing of different topics depending on seasons.

### Tasks

#### Task 1 Developing schemes of work

Schemes of work are critical in teaching, learning and assessment. Therefore they should be carefully developed. In the task, you will develop and evaluate schemes of work.

#### Activity 1 Developing schemes of work



- 1 Review factors to consider when preparing schemes of work in agriculture.
- 2 Prepare a two week schemes of work from Primary school agriculture syllabus.
- 3 Present your work

**Activity 2 Evaluating schemes of work**

- 1 Identify strengths and weaknesses of the schemes of work developed.
- 2 Make improvements on the schemes of work developed by including factors that were not considered.
- 3 Share your findings

**Tips**

- Ensure that agriculture syllabus, teacher’s guide, learners’ books, school calendar and annual calendar are available
- You may use knowledge of Foundation studies for format and factors to consider when developing schemes of work
- You may use any relevant method of presentation

**Task 2 Demonstrating methods for teaching agriculture**

There are different methods that can be used to teach a subject. However, you must select those methods that are appropriate in the teaching of agriculture. In the activities below, you will research on appropriate methods in the teaching of agriculture, demonstrate

and adapt them to suit learners with special education needs.

**Activity 1 Researching on appropriate methods of teaching agriculture**

- 1 Review different methods for teaching agriculture.
- 2 Discuss how each method works
- 3 Identify appropriate methods for teaching agriculture.
- 4 Demonstrate how each method in (3) works.

**Activity 2 Peer - teaching using various methods**

- 1 choose a topic in the primary school teacher’s guide.
- 2 prepare a lesson showing a variety of methods that could be used in presenting the lesson
- 3 present the lesson in peer- teaching
- 4 evaluate the lesson.
- 5 suggest other possible methods that can be used.

**Activity 3 Adapting activities to suit learners with diverse needs in agriculture**

- 1 Discuss how you would take care of learners with the following educational needs in an agriculture lesson:
  - a Hearing impairment
  - b Visual impairment
  - c Physically challenged
  - d Gifted or talented
  - e Slow learners
  - f Emotional disturbance
  - g Multiple disabilities

- h Speech or language impairment
- 2 Present your findings

### Tips

- For Activity 1, you may demonstrate the methods through a lesson presentation or role-playing (acting).
- Presentations for Activity 3 can take different modes such as role-playing, gallery walk, bus stop, plenary and restaurant method.

### Task 3 Analysing challenges in teaching agriculture

Teaching of agriculture has its challenges. Teachers' ability to identify them can help in achieving the learning outcomes effectively. Some challenges are related to the methods of teaching or resources. In the activities to follow you will identify challenges in the teaching of agriculture and come up with their possible solutions.

#### Activity 1 Reflecting on students' personal experiences in large class

- 1 Recall personal experiences learning agriculture in a large class in primary school
- 2 Discuss personal experiences learning agriculture in a large class.
- 3 Discuss how the challenges were addressed.

- 4 Present your findings to the class for discussion.

#### Activity 2 Isolating strengths and challenges that learners face in agriculture

- 1 Conduct a study to find out strengths and challenges learners face in agriculture.
- 2 Analyse different challenges in the learning of agriculture
- 3 Find out ways how teachers manage these challenges
- 4 Share your findings.

#### Activity 3 Discussing management of a large class

- 1 Watch a video clip of a teacher delivering a lesson in a large class.
- 2 Observe how the teacher manages the class

Present your findings

### Tips

- For Activity 2
  - You need to develop interview guide to be used
  - you may interview teachers and learners in nearby schools or you may search in books and internet
- For Activity 3, you may need to download a video clip in advance or watch clip made by school

#### **Task 4 Applying appropriate ways of assessing learners' performance**

When presenting a practical lesson there is need to assess the learners if they are able to perform the required skills as indicated in the success criteria. The right choice of the assessment methods and tools will facilitate the description in achievement levels of the expected skills from the learner. In this task, you will assess learners' work and conduct self-evaluation.

#### **Activity 1 Assessing learners' work in a practical lesson**

- 1 Prepare a practical lesson from the topic 'clearing land for growing fruit trees' from primary school agriculture syllabus.
- 2 Develop assessment tools that you will use in the practical lesson.
- 3 Present the lesson to learners.
- 4 Assess learners' work using the tools developed.
- 5 Identify individual learner's strengths and address their weaknesses.
- 6 Reinforce individual learner's strengths.

#### **Activity 2 Evaluating learner activity books**

- 1 Visit a demonstration school and collect agriculture note books from learners

- 2 Evaluate their work regarding
  - spellings
  - exercises
  - legibility of hand writing
  - taking notes
  - submitting their work for marking
  - making corrections

#### **Activity 3 Reflecting on own teaching practice**

- 1 Reflect on how you handled the following during teaching practice at the demonstration:
  - a use of resources
  - b use of methods
  - c Supervision of class activities
  - d reinforcement of feedback to learners
  - e assessment tools
  - f questioning techniques
  - g clarity of instructions
  - h inclusiveness
- 2 Discuss the findings
- 3 Discuss how you would improve the weaknesses in the next lesson.

#### **Tips**

- For Activity 1,
  - ensure that farm tools are mobilized well in advance for the activity
  - ensure that assessment tools such as checklist and rubric are developed in advance.
  - you may identify the site in advance.

## Summary

In this topic, you have learnt that schemes of work are essential for the organisation of teaching, learning and assessment. Activities planned in the schemes of work should reflect the practical nature of agriculture as a subject. A practical approach in the teaching of agriculture is a must if learners are to acquire basic skills in agriculture production, processing and marketing. They need to have hands on experience hence the inclusion of practical lessons.

You have also learnt different teaching and learning methods that can be used in agriculture such as demonstration, projects, experimentation, field trips, presentations and displays. Resources such as school garden, livestock woodlot, and orchard facilitate practical approaches in the teaching of agriculture. Therefore teachers should ensure that such resources are available and used in the school. The local environment is another bank of resources which teachers can utilise.

You further discussed that teachers face some challenges in the teaching of agriculture such as lack of resources, and large classes. It is important to identify the challenges and find their solutions for effective teaching, learning and assessment use of variety of methods, activities and resources can help to address some of these

challenges. should be used to take care of the different learners needs.

Learners have to be assessed on the learning activities in order to get feedback on their progress. Assessment of practical lessons and projects requires appropriate tools. Development and use of tools like rubric, checklist, reports, and presentations help in identifying the learners' level of achievement and understanding of the concepts.

## Reflection

- 1 What challenges did you face when developing schemes of work in agriculture?
- 2 How can you link topics taught with learners' everyday experience when teaching agriculture?
- 3 Which assessment methods are convenient for large classes?

## Assessment

- 1 Why should learners with diverse needs be considered when preparing schemes of work in agriculture?
- 2 What would be the appropriate time to teach the topic diseases of maize and why?
- 3 Which factors should be considered when preparing the schemes of work in agriculture?
- 4 What methods do you think are appropriate for teaching agriculture in a large class?
- 5 How could you manage a large class during practical lessons
- 6 In what ways would you use ICT to help teaching large class at primary school?

7 What are the common challenges in the teaching of agriculture?

## Glossary

Information Communication

Technology (**ICT**): use of technology to access, present and manipulate information for example, use of smart phone, internet, computer, video, calculator, overhead projector

## References

- Malawi Institute of Education (2008).  
*Initial primary teacher education agriculture tutors book*: Domasi: MIE
- Malawi Institute of Education (2008).  
*Initial primary teacher education agriculture students' book*: Domasi: MIE
- Malawi Institute of Education (2010).  
*Initial Primary Teacher Education ODL Agriculture module 1*. Domasi: MIE
- Malawi Institute of Education (2007).  
*Primary agriculture teachers' guides for standard 6*, Domasi: Malawi
- Malawi Institute of Education. (2007).  
*Primary agriculture teachers' guides for standard 5*, Domasi: Malawi institute of Education
- Malawi Institute of Education. (2007).  
*Primary agriculture teachers' guides for standard 6*, Domasi: Malawi institute of Education.
- Ministry of education science and technology. (2007). *Primary agriculture teachers' guides for standard 7*. Domasi: Malawi institute of Education

- Malawi Institute of Education. (2014).  
*Ways of teaching and ideas for student teachers*. MIE Domasi: Malawi institute of Education
- Malawi Institute of Education. (2015).  
*Critical thinking training manual for Malawi*. MIE Domasi: Malawi
- Malawi Institute of Education. (2013).  
*Critical thinking source book for Malawi*. Domasi: Malawi institute of Education

## **TOPIC 3** Teaching agricultural environments and climate change

**Time** 5 hours

**Term** 2

### **Introduction**

Agricultural production takes place in an environment that has been exposed to different human activities. Some of the activities have contributed to climate change. Agricultural production itself also contributes to climate change.

Climate change has negative effects on agricultural production. As a teacher and a change agent, it is important for you to study and teach the concepts of climate change, its causes and effects and how people adapt in order to survive.

In this topic you will learn how to teach the concepts of climate change, causes, effects and adaptation measures using different methods. You will also develop skills in assessing learners in theory lessons.

### **Success criteria**

By the end of this topic you must be able to:

- analyse the concept of causes and effect of climate change
- use appropriate methods to teach agricultural environment and climate change

- apply appropriate method when teaching causes and effects of climate change
- apply appropriate method in teaching of adaptation
- develop skills in assessing learners in theory lessons

### **Background information**

Climate change is a long-term change in global weather patterns. It occurs as a result of the accumulation of greenhouse gases (GHGs) in the atmosphere. These gases occur naturally while others are produced due to human activities. Climate change has negative effects on agricultural production. There is need to reduce production of these gases as one way of reducing the effects on climate change.

The acquisition of knowledge of agricultural environment and climate change will help teachers to develop knowledge and skills of reducing the accumulation of the GHGs in the atmosphere.

### **Tasks**

#### **Task 1 Analysing causes and effects of climate change**

To adapt to the effects of climate change you must have adequate knowledge of

climate change, its causes and effects. In this topic, you conduct an information search on the principle of greenhouse effect, synthesise the principle, conduct experiments and report the findings.

**Activity 1 Researching on the principle of greenhouse effect**

- 1 conduct an information search on the following:
  - a principle of Greenhouse effect,
  - b causes of climate change
  - c effect of climate change
  - d adaptation measures to climate change.
- 2 Report your findings

**Activity 2 Synthesising the principle of greenhouse effect**

- 1 Discuss the principle of greenhouse effect
- 2 Summarise key ideas in the principle
- 3 Present the findings to the class for discussion.

**Activity 3 Examining syllabus coverage of climate change**

- 1 study the agriculture primary school syllabus and teachers' guides
- 2 identify the main ideas on climate change taught at different levels in the primary school.

Table 3.1 Level of coverage by class

Standard	Level of coverage
5	
6	

7	
8	

- 3 Compare your findings with what you learnt in Activity 2
- 4 Share the findings during a plenary.

**Tips**

- For Activity 1, you may search information related to the activity on the internet and other books such as *Climate change: sourcebook for primary school teachers*; journals, newspapers and radio programmes
- For Activity 2, ensure that primary school syllabus, teachers' guide and learners' books are available to check the level of coverage of the topic.

**Task 2 Using appropriate methods when demonstrating the principle of greenhouse effect**

There are different methods of teaching concepts in agriculture. In order to turn theory into practice, experimentation plays an important role. You will teach the principle of greenhouse effect using experimentation and report the findings.

**Activity 1 Discussing appropriate methods for teaching causes and effects of climate change**

- 1 Review methods for teaching climate change
- 2 Discuss how each of the selected method works
- 3 Present the findings

**Activity 2 Conducting an experiment to demonstrate the principle of greenhouse effect**

- 1 Plan an experiment to demonstrate the principle of greenhouse effect.
- 2 Explain the aim of the experiment clearly
- 3 Set up the experiment
- 4 Observe the experiment
- 5 Record the findings

**Activity 3 Reporting the findings**

- 1 Plan a reporting session for the experiment
- 2 Consolidate the observations
- 3 Improve your experiment to demonstrate the principle based on the observations

**Tips**

- Other methods for Activity 1 include: Problem tree; values clarification; enter-educate; drama; role-play, case study
- For Activity 3 you may use different critical thinking methods to allow others to make observations such as bus stop, and restaurant
- For ways of presenting as in Activity 3, you may use talk

**Task 3 Using appropriate methods to teach agricultural environment and climate change**

When teaching concepts of agricultural environment and climate change, it is important to use approaches that encourage learner participation and critical thinking. One such method is the Future’s Wheels. The method examines causes and effects of certain decisions as is the case with climate change. In this task, you will review how the method works and analyse the causes and effects of climate change using the Future’s Wheels.

**Activity 1 Reviewing Futures’ wheels as a teaching method**

- 1 Review the procedures followed when teaching using Future’s Wheels.
- 2 Discuss the procedures for the Future’s Wheels.
- 3 Share the findings.
- 4 Examine the consequences of any of your present behaviour on climate.
- 5 Share your findings.

**Activity 2 Analysing causes and effects of climate change**

- 1 Conduct an information search on causes and effect of climate change



- 2 Prepare teaching and learning resources that can be used to teach causes and effects of climate change using Future's wheels.
- 3 Develop Future's wheels of the causes and effects of climate change.
- 4 Analyse the causes and effects of climate change.

**Activity 3 Presenting results of the future's wheels**

- 1 Display charts showing the developed Future's Wheels
- 2 Allow others to make observations.
- 3 Draw lessons from the Future's Wheels.

**Task 4 Applying appropriate methods in teaching adaptation measures to climate change**

Teaching climate change requires methods that appeal for change in attitude for the learners. In this task, you will identify and use a variety of participatory methods that are appropriate for teaching adaptation measures to climate change

**Activity 1 Self-studying on adaptation measures to climate change**

- 1 Conduct an informal inquiry on adaptation measures to climate change.
- 2 Compile the results of your inquiry.
- 3 Analyse the results (giving meaning to the results of the inquiry).
- 4 Write your report.

- 5 Present your findings.

**Activity 2 Examining level of coverage of the topic "adaptation to climate change"**

- 1 Identify the standard in which adaptation to climate change is learnt in primary schools
- 2 Examine the level of coverage of the topic .
- 3 Compare it with your knowledge of the topic.
- 4 Report your findings.

**Activity 3 Discussing appropriate methods for teaching adaptation measures to climate change**

- 1 Brainstorm appropriate methods for teaching adaptation measures to climate change
- 2 Discuss appropriate methods for teaching adaptation measures to climate change
- 3 Present in plenary

**Activity 4 Selecting appropriate methods for teaching and learning adaptation measures to climate change**

- 1 Make an analysis (strengths and weaknesses) of teaching methods discussed in Activity 3.
- 2 Choose suitable methods according to your learners' abilities.

3 Share your ideas in plenary

### **Activity 5 Teaching adaptation measures to climate change**

- 1 Develop lessons on “adaptation measures to climate change” using the methods selected in Activity 4
- 2 Peer-teach the lessons
- 3 Evaluate the lessons

#### **Tips**

- For Activity 1, parents/guardians /fellow college students, other support staff members (grounds people, cooks, messengers) can be a good source of information.
- For Activities 3 and 4, you may consider the following methods:
  - pair work
  - think-pair-share
  - gallery walk
  - demonstration
  - resource persons
  - field trip/educational visit
  - role- playing

### **Task 5 Developing skills in assessing learners’ work in theory lesson**

Student teachers need to have skills in assessing learners. Assessment items must be accompanied by marking scheme or key. In this task, you will develop and critique test items and a

marking key on the topic “climate change”.

### **Activity 1 Developing test items and a marking key for a topic “climate change”**

- 1 develop test items based on the success criteria from primary agriculture syllabus
- 2 set the test items according to Blooms taxonomy.
- 3 develop a marking key
- 4 award marks to each question according to the level of difficulty of the questions and relevance for learner’s mastery and application in life
- 5 develop grading scale for learners’ performance

### **Activity 2 Critiquing the developed test items and marking key**

- 1 Submit the test items and marking key for critiquing based on the following criteria:
  - i. equitable distribution of questions from the topic “climate change” (content coverage)
  - ii. level of difficulty following blooms taxonomy
  - iii. clarity of instructions
  - iv. clarity of the questions
  - v. distribution of marks
  - vi. typing error such as spelling, punctuations, word/ sentence spacing
  - vii. clarity of illustrations

## 2 Discuss the findings in plenary

### Tips

- For Activity 1, you may use the approved grading scale
- For Activity 2, you need agriculture syllabus, teachers' guides, Learners' book and a copy of Bloom's taxonomy.
- Use your knowledge of Foundation studies to develop the blue print for equitable distribution of questions in covering the syllabus.

### Summary

In this topic, you have learnt that climate change is an average long-term change in global weather patterns due to accumulation of greenhouse gases. These greenhouse gases include: carbon dioxide, methane, chlorofluorocarbons, nitrous oxide. Human activities that release greenhouse gases are

- ploughing which releases trapped carbon dioxide
- burning of fossil fuels (petrol, diesel paraffin, coal) and crop residues
- some gases from refrigerators such as chlorofluorocarbons
- careless cutting down of trees which reduces carbon dioxide absorption

and releases it during decomposition or burning, and

- careless dumping of waste materials which produces methane during fermentation.

Accumulation of the greenhouse gases in the atmosphere forms a layer that acts as a blanket. This layer allows light from the sun to pass through and heat the earth but it prevent the heat from escaping. This results in global warming that causes climate change.

A similar situation occurs in a greenhouse where crops are grown for agricultural research and during cold months. This greenhouse is made of a transparent plastic sheet or glass that allows light to pass through and change into heat. The heat trapped in the house makes it warm to enable crops grow and develop faster. This is known as "greenhouse effect" as shown in Figure 3.1.

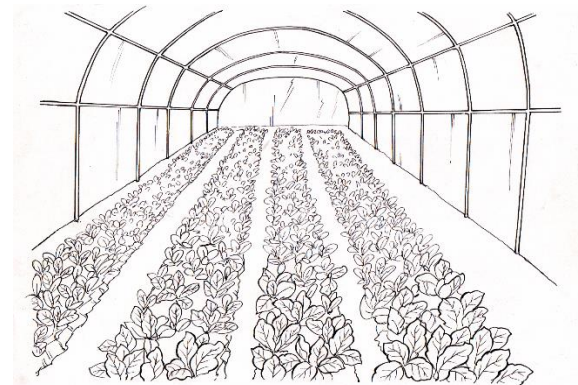


Figure 3.1 Cabbage growing using greenhouse principle

You also learnt negative effects of climate change which include are: floods which destroy crops, bridges,

school buildings, roads as shown in figure 3.2 and increases disease incidences such as malaria, cholera; abnormal rainfall patterns resulting into poor harvests and hunger; drought which results into water shortages for irrigation and causing school children to walk long distances in search of water.

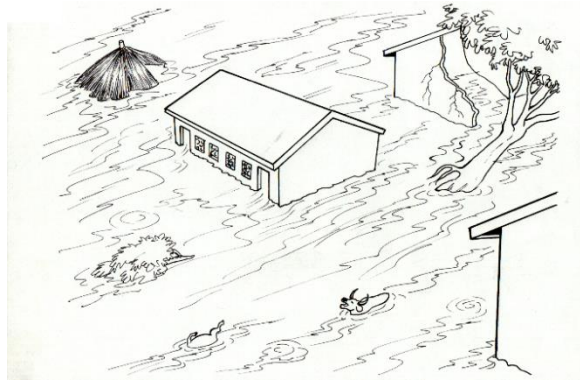


Figure 3.2 Effects of floods

You further learnt that some of adaptation measures to the effects of climate change include using drought tolerant and early maturing crop varieties, using pest and disease resistant crops and livestock, growing a variety of crops so that when one crop fails, the farmer can depend on the other rain water harvesting.

Furthermore you learnt that emission of greenhouse gases can be reduced by planting trees and vegetation, practising conservation agriculture, avoiding setting bush fires,, reduce, recycling and reusing wastes.

You also learnt a variety of methods for teaching climate change such as Future's Wheels, values clarification, edu-tainment, role-play,

experimentation, drama and problem-tree. You further developed test items and marking key.

## Reflection

- 1 How does climate change arise?
- 2 Which methods do you think capture your learners' most and least attention?
- 3 What is your opinion about **assessment** as part of teaching and learning process?

## Assessment

1. Analyse the strengths and weaknesses of the following methods: used for teaching/learning agricultural, environmental and climate change.
  - a. research/inquiry
  - b. project
  - c. Future's wheels
  - d. brainstorming
- 1 Explain how you would use these assessment tools:
  - a observation checklists,
  - b quiz/test items,
  - c interview schedule/questionnaire,
  - d rubrics
- 2 Assume that you have taught the topic "climate change" to your learners .
  - a set test items on the topic "Climate change
  - b develop a marking key for test items

## Glossary

**Adaptation:** act of suiting/fitting in a situation

## References

- Bloomsbury Information (2006).  
*Dictionary of agriculture*. 3<sup>rd</sup> edition, publ. Blooms Plc Broadway: New York
- Kamangira, Y T (2012). *Teaching and learning strategies in agriculture education*, Unpublished module for University Certificate of Education (UCE). Zomba: Chancellor College.
- Kang, M S (2007). *Agricultural and environmental sustainability considerations for the future*. pbl. New York: The Haworth Press
- Lenne, L.M and Wood, D (2011).  
*Agrobiodiversity management for food security: A critical review*, publ. UK: CAB
- Malawi Institute of Education (1998). *A sourcebook for population education in Malawi*. publ. Domasi: MIE.
- Haines, M (1985). *An introduction to Farming Systems*, publ. London: Longman.
- Reynolds, M P (2011). *Climate change and crop production*, publ. Oxfordshire: CAB.
- Rogers, A (1986). *Teaching adults*, publ. Philadelphia: Open University Press.

## **TOPIC 4** Teaching farm records

**Time** 4 hours

**Term** 2

### **Introduction**

In the business of farming, several activities are involved. These activities need to be recorded accurately for planning, budgeting and decision making. Teaching of farm records can help learners to develop record keeping skills which are important in agribusiness. It is therefore important for you to appreciate the value of teaching farm records.

In this topic, you will explore the concepts of farm records and use appropriate teaching, learning and assessment methods and resources when teaching farm records in primary schools. In addition, you will use appropriate strategies for assessing learners on farm records.

### **Success criteria**

By the end of this topic, you must be able to:

- reflect on the concepts related to farm records
- use appropriate methods in teaching farm records
- apply appropriate strategies for assessing learners' work in farm records

### **Background information**

There are different activities that are carried out on the farm. Such activities include: farm purchases, field operations and livestock management practices. A record of all these activities is what is called farm records.

There are three main types of records namely financial, production and inventory records. Examples of financial records include sales record and purchases record; production records include field operation record, crop record and labour record; inventory record include a record of items, infrastructures, farm equipment and machinery in possession of a farmer.

By teaching farm records in primary schools, learners will be able to monitor farm activities in their homes and be able to practice agriculture for profitability. However most people do not keep these records due to negative attitudes towards record keeping. Currently farm operations are becoming more and more business oriented. It is therefore important for anybody in production to keep records in order to remain in business.

### **Tasks**

**Task 1** Reflecting on the concepts related to farm records

In this task you will conduct an independent investigation on concepts related to farm records. Furthermore you will find out how much of the topic is covered in the primary school agriculture curriculum and activities which learners can do in order to understand concepts related to farm records.

**Activity 1 Conducting an independent research on concepts related to farm records**

- 1 Conduct an independent research on the concepts related to farm records.
  - Types of farm records
  - Components of each farm record
  - importance of farm records
  - common records kept by farmers
  - effect of gender on record-keeping
- 2 Share your findings with your colleagues in a plenary.

**Activity 2 Identifying levels and depth of coverage of the topic at primary school**

- 1 Using the primary school teachers' guides and learners' books, find the classes in which the topics are taught and its level of coverage. Use the following table

*Table 4.1 class and level of coverage*

Class	Coverage
4	
5	
6	
7	
8	

- 2 Present your findings.

**Activity 3 Discussing concepts related to farm records**

- 1 Are you able to remember everything that happened during your birthday celebration?
- 2 Why can you remember or cannot remember the events?
- 3 Discuss the meaning, types and importance of farm records
- 4 Research on common farm records kept in your area
- 5 Share the findings with your colleagues.
- 6 Practise writing different types of farm records in a plenary
- 7 Display your work for a gallery walk.

## Tips

- For Activity 1, use library books, prescribed textbooks (college and primary schools), internet (computers/ students' cellphones).
- For Activity 2, use teachers' guides and learners books.
- discuss with friends to establish the classes and level of coverage for the topic in primary schools
- use different methods for sharing findings such as gallery walk, presentations
- For activity 2, use other notable life events other than birthday celebrations.
- Have real diaries for the activity
- Relevant samples of farm records may as well be used.

## Task 2 Using appropriate methods for teaching farm records

In this task you will explore appropriate methods for teaching farm records. You will also develop tools for assessing practical lessons for farm records.

### Activity 1 Exploring methods for teaching farm records

- 1 Discuss the methods that would be appropriate for teaching the topic "farm records."

- 2 Discuss how the following methods can be applied in the teaching of the topic "farm records" field trip, think-pair-share, question and answer, brainstorming and role play.
- 3 Present your work.

### Activity 2 Discussing procedures for a practical lesson when teaching "farm records"

- 1 Outline procedures for a practical lesson.
- 2 Discuss procedures for practical lesson.
- 3 Present the finding for discussion.

### Activity 3 Analysing strengths and challenges for practical lesson on "farm records"

- 1 Brainstorm strengths and challenge faced when conducting a practical lesson.  
Identify strengths and weaknesses of using a practical approach when teaching a topic in farm records.
- 2 Suggest solutions to the challenges.
- 3 Share your findings for discussion.

### Activity 4 peer-teaching farm records using a practical method

- 1 Prepare practical lesson on a topic on farm records.
- 2 Peer-teach the lesson
- 3 Evaluate the lesson

### Task 3 Applying appropriate strategies for assessing learners' work on farm records



In this task you will develop tools for assessing practical lessons in teaching farm records. The task will also expose you to the tools for assessing the teaching of farm records and you will practice using the tools to check their effectiveness.

### **Activity 1 Developing tools for assessing learners' work in practical lessons**

- 1 prepare a lesson in which learners would practice preparing different farm records
- 2 in your lesson indicate the type of farm record and resources to be used
- 3 develop a checklist and a rubric for observing a practical lesson on farm records
- 4 peer-teach using the prepared lesson.
- 5 using the developed checklist and rubric, assess the presentations
- 6 evaluate the lessons based on the results and the effectiveness of the assessment tools developed.

### **Activity 2 Discussing assessment tools and strategies for teaching farm records**

- Discuss the assessment tools you could use to observe practical activities in the teaching of farm records
- Discuss how you would use them in the course of observing the activities.

## **Summary**

In this topic you have learnt that there are three main types of farm records namely financial, production and inventory. You have also learnt that farm records are important because they help farmers obtain loans, provide information for fair calculation of income tax, help farmers check whether their farming enterprise is operating at a profit or loss and provide history of farm operations from one period to another for easy comparison of performance. Farm records need to be kept properly and must, therefore, not be written on loose pieces of paper.

You have also discussed appropriate methods for teaching farm records such as substitution tables, practicals and field trips. You also practised presenting lessons using different strategies such as field trip, think-pair-share and role playing. Finally, you developed and practised assessment of the topic using tools like checklist and rubric.

## **Reflection**

- 1 What are the necessary skills that teachers and learners require for successful teaching and learning of farm records?
- 2 What methods would be more appropriate in the teaching of the following:
  - a meaning of farm records
  - b types of farm records
  - c importance of farm records

- 3 What resources would be suitable for teaching the topic?
- 4 Why are the rubric and checklist more appropriate for assessing practical work? Construct labour and crop records using the data given above.
- 5 Compare a checklist and rubric in terms of how they are used in assessment.
- 6 How different are the two tools in terms of measuring learners' attainment of knowledge and skills?
- 7 Which tool would be more appropriate for assessing practical lessons?

### **Assessment**

- 1 Describe farm records
- 2 How would you classify farm records?
- 3 With relevant examples, describe the keeping records can help an agricultural entrepreneur.
- 4 Give any four types of farm records a bee-keeper can have.
- 5 Mrs. Konyani is a farmer. In the 2016/17 cropping season she grew maize on plot 1 with an area of 4 hectares and soya beans on plot 2 with an area of 3 hectares. She kept the information in a farm diary and later transferred it into relevant records.

**Table 4.2 Crop and labour record**

Date	Activity	Number of persons	Time in days	Maize (labour days)	Soya beans (labour days)
14/06/14	Clearing in plot 1	5	6	30	
22/06/14	Clearing in plot 2	5	6		30
17/07/14	Ridging in plot 1	5	10	50	
04/08/14	Ridging in plot 2	7	7		49
19/08/14	Manuring in plot 1 at 12.6 tons per hectare	5	12	60	
04/09/14	Compost manure in plot 2	4	15		60
18/11/14	Planted 60kg of DK 8031 maize in plot 1	10	1	10	
21/11/14	Planted 100kg soya beans in plot 2	20	1		20
01/12/14	Applied 600kg of 23:21:0 + 4% S fertilizer on plot 1	20	3	60	

## Glossary

**Inventory**– written information on items available

## References

Malawi Institute of Education (2007).  
*Agriculture teachers' guide for Standard 6*, Domasi: Malawi Institute for Education.

Malawi Institute of Education (2007).  
*Agriculture learners' book for Standard 6*. Domasi: Malawi Institute for Education.

Malawi Institute of Education (2008).  
*Agriculture teachers' guide for Standard 7*. Domasi: Malawi Institute for Education.

Malawi Institute of Education (2008).  
*Agriculture learners' book for Standard 7*. Domasi: Malawi Institute for Education.

Malawi Institute of Education  
(2008). *Initial primary teacher education: Agriculture lecturers' book*. Domasi. Malawi Institute for Education.

Malawi Institute of Education (2008).  
*Initial primary teacher education: Agriculture students' book*. Domasi, Malawi Institute for Education

Kanjala B M and Kaperemera N T  
(2001). *Strides in agriculture*. Blantyre Longman.

[www.thespruce.com/how-to-keep-farm-records-3016896](http://www.thespruce.com/how-to-keep-farm-records-3016896). Lauren A *How to keep farm records*. Updated 19/11/2016

## **TOPIC 5** Teaching Irrigation

**Time** 3 hours

**Term** 2

### **Introduction**

Agriculture involves production of crops and raising of livestock. You might have been involved in the production of different crops like maize, groundnuts and vegetables in your home. Crop production depends on water. Where rainfall is scarce, inadequate or unreliable you need to supplement it with irrigation. The teaching of irrigation will equip you basic principles.

In this topic therefore, you will review concepts of irrigation. You will also learn appropriate methods for teaching and learning irrigation and use different methods to assess learners work. This will help you to teach the topic of irrigation effectively.

### **Success criteria**

By the end of this topic you must be able to:

- develop an understanding of the concept of irrigation
- apply appropriate methods in the teaching of irrigation
- use assessment results to improve teaching and learning of irrigation

### **Background on irrigation**

Malawi's economy largely depends on agriculture. Agriculture is key to food security, economic growth and wealth creation. However, the agriculture sector faces several challenges including over dependence on rain-fed farming. Malawi is experiencing unpredictable rainfall patterns. In order to increase crop production, there is need to ensure that there is continuous supply of water to crops.

Teaching the topic 'irrigation' should be a catalyst for you to acquire needed knowledge, skills and attitudes. This will assist learners to gain knowledge, skills and attitudes and apply them in growing crops at school or at their homes. The topic can effectively be taught if teachers use appropriate methods of teaching and learning such as KWL, gallery walk or think-pair-share. Learners can learn well if they can be allowed to make an excursion to visit active irrigation unit to observe and report their findings. On the other hand, limited irrigation facilities, inadequate knowledge of irrigation and low learners' participation in the lessons might be some of the challenges in teaching of the topic.

Effective teaching and learning goes hand in hand with assessment.

Therefore both formative and summative assessment must be used.

## Tasks

### Task 1 Developing of an understanding of the concept of irrigation

Growing of crops depends on availability of rainfall. People artificially supplement this rainfall in different ways. Therefore you will search concepts of irrigation and identify topics on irrigation taught in primary schools.

### Activity 1 Researching on irrigation concepts

- 1 conduct research on the following:
  - a concept of irrigation
  - b importance of irrigation
  - c methods or types
- 2 identify the method of irrigation in Figure 5.1
- 3 make a summary of the findings.
- 4 present your findings to the class for discussion.

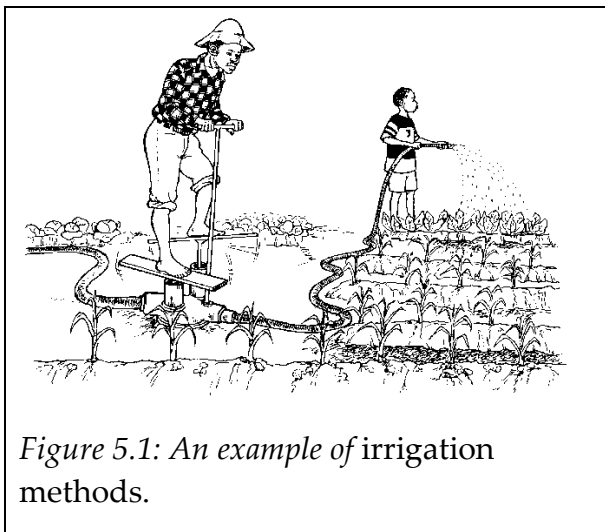


Figure 5.1: An example of irrigation methods.

### Activity 2 Identifying topics on irrigation taught in primary schools

- a make an appointment with a nearby primary school agriculture teacher
- b inquire from the teacher topics about irrigation taught in primary school
- c compare listed topics with key concepts of irrigation in Activity 1 above.
- d Share your findings with your friends for discussion

#### Tips

- Refer to agriculture teachers guide, learners' book, syllabus for primary school Standard 6 for all tasks.
- For Activity 1:
  - use internet or relevant books to search for illustrations on methods of irrigation.
  - give clear instructions to learners on what to do on the visit for learners in the primary schools.
  - You may consult IPTE Agriculture handbook and IPTE ODL module 1
- For Activity 2, you may need to organize a visit to a nearby place where irrigation is practiced and take notes.

## **Task 2 Applying appropriate methods in the teaching of irrigation**

Varying of teaching and learning methods accommodates learners with different learning styles in classroom. In this task you will analyse methods for teaching irrigation, prepare micro-lessons and present them.

### **Activity 1 Analysing methods appropriate for teaching and learning irrigation**

- 1 Use any relevant ICT tools to search for methods you can use to teach the topic on irrigation to your learners
- 2 List down your findings
- 3 Compare these methods with the methods that your lecturers are using when teaching
- 4 Describe how each method works.
- 5 Select the appropriate method you can use to teach the topic on irrigation.

### **Activity 2 Identifying resources for teaching and learning irrigation**

- 1 Think of possible resources you can use to teach the topic 'irrigation'.
- 2 Select resources that are appropriate for teaching the topic on irrigation.
- 3 Share your findings to class for discussion.

## **Activity 3 Preparing micro-lessons and presenting them**

- 1 Prepare a micro-lesson on the topic "methods of irrigation" using research method.
- 2 Refer to activity 2 to identify the resources for teaching the topic "methods of irrigation"
- 3 Present your micro-lesson using the research method
- 4 Let your colleagues comment on your presentation

#### **Tip**

- For Task 2 activity 1 You may use KWL, brainstorming, discussion, demonstration, research, question and answer .

## **Task 3 Using assessment results to improve teaching**

Teachers are required to use assessment results to improve teaching and learning. This can be achieved through proper assessment methods.

### **Activity 1 Exploring assessment methods appropriate for teaching irrigation**

- 1 Suggest methods for assessing learners in the topic "methods of irrigation"
- 2 Discuss how each assessment method works.

- 3 Select from the list those assessment methods that are appropriate for assessing the topic “methods of irrigation”.
- 4 Share your findings with colleagues.

**Activity 2 Assessing learners’ work and analysing results in teaching of irrigation**

- 1 Organize practical activity with learners to irrigate flower or vegetables around school.
- 2 Let learners practice watering the crops.
- 3 Identify skills to be assessed.
- 4 Complete the check list below and use it to check learners performance.

Name of learner	Skills for assessment					
	skill 1		Skill 2		Skill 3	
	Yes	No	Yes	No	Yes	No
Mary Phiri						
John Hezekia						
Hanifu Saidi						

- 5 Observe and record learners work using the check list.
- 6 Identify skills in which learners require improvement using the check list.
- 7 Improve the teaching and learning based on the weaknesses identified

**Tips**

- For Activity 1, you may use knowledge from Foundation studies to identify assessment methods.
- Prepare assessment tools in advance of the lesson
- For Activity 2:
  - provide appropriate tools for irrigation such as watering can, horse pipe.
  - you may consider the following as skills for assessment in the checklist: participation, distribution of water, handling of watering can/ hose pipe, height of irrigation from the ground
  - to improve the teaching and learning you may consider the following: demonstration and revision.

**Summary**

In this topic you have learnt that irrigation is the artificial supplying of water to crops onto a field to enable them to grow. You have also learnt using different methods of irrigation like sprinkler which supplies water to crops through pipes with nozzles at the end to spray water; drip or trickle irrigation which leads water directly to the planting station through perforated pipes laid out on the ground; basin irrigation which leads water to basin-like structures through furrows or



channels; and flooding irrigation in which water is applied to the plot wildly like floods. You have also covered the importance of irrigation such as avoiding risk of hunger and helping farmers to grow crops several times in a year.

You further studied methods of teaching the topic “irrigation” such as research method where learners can find information on their own, project method where learners are assigned task to apply learnt concepts, KWL where learners are helped to think of what they already know, raise questions about it and find answers to those questions, and demonstration where a teacher, with assistance from the learners, shows how to carry out an activity. Furthermore, you have analysed assessment results to improve teaching and learning.

### Reflection

- 1 What challenges did you face in the topic?
- 2 How did you deal with the challenges?
- 3 Which method of assessment was unfamiliar to you?

### Assessment

- 1 You are planning to teach the topic importance of irrigation” in standard 6, describe any three methods you would use in teaching the topic?
- 2 Assume that your learners are engaged in project on vegetable growing, develop an assessment tool you can use to assess their work.

- 3 Design a drip irrigation using locally available resources that can be used in teaching the topic “methods of irrigation” for teaching?
- 4 How can you make use of school borehole to teach learners methods of irrigation?
- 5 Connect what you have learnt on concepts of irrigation to use of waste water from bathroom in your home.
- 6 Discuss any three improvements that you would make after assessing a learner’s work?
- 7 Connect what you have learnt on concepts of irrigation to use of waste water from bathroom at your home.

### Glossary

- Furrow** a narrow trench or channel made in the ground for irrigation
- Drip** let fall or to shed small drops of water

### References

Malawi Institute of Education (2008).  
*IPTE agriculture tutors book.*

Domasi: MIE

Malawi Institute of Education (2007).  
*Agriculture teacher’s guide and learners book for Standard 6.*

Domasi: MIE

Ministry of Education, Science and Technology. (2009) *IPTE ODL module 1.* Lilongwe: DTED

<https://water.usgs.gov/edu/inqukklook.html>

<https://www.reference.com>different-tg>

## TOPIC 6

# Establishing a school garden as a teaching learning and assessment resource

**Time** 4 hours

**Term** 2

### Introduction

A school garden is an important resource in the teaching, learning and assessment of learners work in agriculture. It is where experiments, projects, demonstration of various production practices are done.

Establishing a school garden requires input from learners, teachers, head teachers, school management committees, mother support groups, Parent and Teachers Association (PTA), and the community. Involvement of these stakeholders can help in areas of management, mobilisation of resources, utilisation and security. The school garden can facilitate in developing positive attitude in learners and the community as they appreciate the skills and benefits of agricultural production. Knowledge on establishing and management of the school garden will help school as this helps to link theory into practice and help teachers transfer necessary skills to primary school learners for further education and survival.

In this topic you will establish a school garden as a teaching, learning and assessment resource.

### Success criteria

By the end of this topic you must be able to:

- Reflect on a school garden as a teaching, learning and assessment resource
- establish a school garden
- use the school garden as a teaching, learning and assessment resource

### Background information

A school garden is a resource in the teaching and learning process. This is the case because it is where learners supported by teachers grow a variety crops and raise small livestock for learning purposes. Learners can conduct experiments on how some factors of production can affect the growing of crops and raising of small livestock. As they grow various crops in the garden they acquire different skills on how to grow crops and raise livestock. A school garden can comprise of several crops as shown in figure 6.1.

Teacher Training colleges and primary schools should ensure that they have school gardens. Teaching and learning using a school garden will be depend on

hands on experiences. These experiences include designing the school garden and carrying out farm operations.

In most schools gardens do not exist. This is due to a number of challenges which include: Lack of knowledge by some agriculture teachers, lack of commitment and interest, lack of support from stakeholders, inadequate land and resources

As teachers, you must also use the school garden as an assessment resource. Assess skills which learners are acquiring as they are conducting the project.

### **Tasks**

#### **Activity 1 Reflecting on a school garden as a teaching, learning and assessment resource**

The school garden can be used as a teaching and learning resource. In this task, you will reflect on school garden experiences when you were in primary school and relate its importance to teaching of agriculture.

#### **Activity 1 Reflecting on school garden experiences**

- 1 Recall your experiences of a school garden as shown in figure 6.1 in terms of the following:
  - a your understanding of the concept
  - b enterprises in the school garden
  - c how you were involved
  - d how you benefited

- 2 Share your experiences with your colleagues.

#### **Activity 2 Discussing how the school garden was used**

- 1 Discuss how the school garden was used by the following groups of people:
  - a learners
  - b teachers
  - c community
- 2 Think of how differently you would use the school garden,
- 3 Present your findings in plenary

#### **Activity 3 Relating the importance of school garden to teaching of agriculture**

- 1 Research on the role of school garden in the teaching of agriculture
- 2 Present your findings for discussion.

### Tips

- For activity 1
  - you may use your primary or secondary school and home experiences
  - consider using the following methods: pair share, walk around, talk around
- For activity 2
  - you may use internet, books and journals to find the information
  - the following methods may be used work station and gallery walk
  - you may conduct a book search, ICT or ask individuals

### Activity 1 Developing plans for establishing the school garden

- 1 Discuss factors to consider when establishing a school garden
- 2 Identify an area where you can establish a school garden
- 3 Discuss factors that you considered when choosing the site in (2)
- 4 Present your findings for discussion

### Activity 2 Designing a school garden

- 1 Develop a design for your school garden
- 2 Compare your design with any other designs of a school garden from the internet or other books or other sources
- 3 Present your findings

### Activity 3 Establishing a school garden

- 1 Select the design suitable for your school environment.
- 2 Use the map to establish or improve the school garden.

### Task 2 Establishing a school garden

Establishing a school garden requires proper planning, will discuss and develop plans before establishing a school garden.

### Tips

- For Activity 1,
  - you may search on the internet, books, e.g. sourcebook on school gardens for TTC and primary schools.
  - you may sketch a map of your garden
- For Activity 2, consider using the following methods: work station, one stay and three astray; artistic problem solving; group work and fish bowl
- Ensure that different designs of school gardens are available.

### **Task 3 Using a school garden as assessment resource**

School gardens at a school facilitate teaching, learning and assessment through hands on experiences. In this task, you will prepare and present a practical lesson on growing vegetables and evaluate the observed lesson.

#### **Activity 1 Preparing practical lesson on growing of vegetables**

- 1 review procedures for a practical lesson
- 2 prepare the site for growing of vegetables.
- 3 mobilise resources
- 4 conduct a project in growing vegetables.

#### **Activity 2 Preparing tools for assessing learners work during practical lessons**

- 1 review tools for assessing learners' work during practical lessons
- 2 develop tools for assessing learners' work during practical lessons you developed in Activity 1
- 3 Present your work for discussion.

#### **Activity 3 Using a school garden for teaching, learning and assessment**

- 1 demonstrate activities in the growing of vegetables
- 2 involve learners in practising the activities in the growing of vegetables using the school garden.
- 3 assess learners work during the lesson

### Tips

- For activity 1 you may use your knowledge from Foundation studies to review procedures for a practical lesson
- For Activity 3 you may include activities such as land preparation, nursery establishment, field bed preparation, transplanting and weeding
- For Activity 2 assessment tools may include checklist, rubric, test items and marking key/scheme
- For activity 3, consider assessing learner skills such as taking accurate measurement, making accurate observations, recording, doing the production practices appropriately

### Summary

In this topic you have learnt about school garden as a piece of land within the school environment used for growing crops and raising small livestock with learners for learning purpose. This will help both teachers and learners in several ways for example, awareness of the relationship of theory in the classroom and practice in their natural environment; encourage good nutrition for learners, teachers and surrounding community; beautifying the surrounding; raise awareness of the

need for protecting the soil and water and generating school income.

You have also learnt that in order to successfully establish a school garden you need to consider factors such as attitudes of the community, teachers and learners; primary purpose of the garden; involvement of stakeholders such as teachers, learners and the community. You also need to select suitable site for a school garden. In order to do this you need to consider nearness to water supply, nearness to school, crops to be grown, type of soil and steepness of the land.

You further learnt that you can assess learners' work in a practical lesson using a checklist, rubric and test items of teachers. Therefore, when planning a lesson, teachers need to identify specific skills.

### Reflection

- 1 How can you ensure that my school fully recognise the garden as a teaching, learning and assessment resource?
- 2 In what ways can you involve learners in planning, decision making, and organisation of a school garden?
- 3 How can a teacher lobby for support from the community and other stakeholders on school gardens?
- 4 How can the use of school garden empower learners with diverse needs such as orphans, or children coming from poor families?

- 5 How can you make a school garden sustainable where there is water problem.

### **Assessment**

- 1 Explain any three things that are considered when establishing garden.
- 2 As a teacher, how would you use a school garden for the following:
  - a. teaching and learning
  - b. assessment

### **References**

Malawi Institute Education (2008). *Initial primary teacher education Agriculture tutor's book*. Domasi: MIE.

MIE (2010) *Initial Primary Teacher Education ODL Agriculture module 1*. Domasi. MIE.

Kanjala B M and Kaperemera N T (2000). *Strides in agriculture 1* Blantyre: Longman.

*Living schoolyard transformation manual*, UNICEF not published.

Chiumia A C (2012). *Practical agriculture education: translating theory into practice*. Domasi. MIE.

Ngugi D et al (1990). *East African agriculture*. Macmillan Malaysia

MIE (2014). *Ways of teaching and ideas for student teachers*. Domasi. MIE.

MIE (2015). *Critical thinking training manual for Malawi*. Domasi. MIE

MIE (2013). *Critical thinking sourcebook for Malawi*. Domasi. MIE.

## **TOPIC 7** Teaching of arable crops

**Time** 5 hours

**Term** 2

### **Introduction**

In topic 6, you learnt about school garden establishment. This topic falls under core-element crop production. Another topic under this core-element is teaching of arable crop production. As a primary school teacher, you are expected to teach this topic to primary school learners. This topic will help you to have a clear understanding of the topic so that you can teach it with ease. Learners will benefit by acquiring knowledge, skills and develop positive attitude towards crop production.

In this topic you will learn how to grow various arable crops and how to teach and assess learners' work using appropriate methods and resources.

### **Success criteria**

By the end of this topic you must be able to:

- develop an understanding of the concepts of arable crop production
- mobilise effective resources for teaching and learning arable crops
- apply appropriate methods in the teaching of arable crops
- use innovative methods for assessing learners when teaching arable crop production.

### **Background information**

The teaching of arable crop production requires that you have adequate knowledge of the content of the topic. The content includes choice of suitable crops for the area and husbandry practices for the identified crop. You also need to make an appropriate choice of the assessment methods and resources for the topic.

Most areas in Malawi suit a variety of arable crops and this gives a wide choice of crops to be grown for teaching. The learners have experienced the growing of most arable crops in their communities which you can use for teaching.

For the learners to acquire the expected knowledge and skills, practical approach to the teaching of the arable crops is the most appropriate. Some of the resources for the practicals are found around the school while others can be brought by the learners.

The teaching of arable crop production may face a challenge of limited resources for the large classes; negative attitude for some teachers and the community in doing the practicals and security problems for the crop. As a teacher, you need to devise the best approach to do the practicals.



## Tasks

### Task 1 **Developing an understanding of the concept of growing arable crops**

Teachers must show expertise in the topic being taught. This requires resourcefulness in order to show authority in the subject. In this task, you will search for information on production practices for growing arable crops and discuss the findings with colleagues.

#### Activity 1 **Searching for information on maize production practices**

- 1 Brainstorm on common arable crops in Malawi
- 2 Chose suitable arable crops for the area
- 3 Search information on production practices for growing maize.
- 4 Write a summary of the production practices
- 5 Present the results

#### Activity 2 **Discussing maize production practices**

- 1 Discuss each production practice
- 2 Write a summary report of how each production practice is done, advantage and disadvantages of each practice.
- 3 Present the findings

## Tip

- You may search information about maize growing from various books in the library, internet or contact Agriculture extension officers

### Task 2 **Mobilising resources for teaching and learning of arable crop production**

The teaching and learning of arable crops require a variety of resources. Some of the resources can be collected or made locally at the school/college. In this task, you will identify resources that can be used in the teaching and learning of the arable crop production, collect those that are found within the surrounding, develop those that you cannot find and display for others to see.

#### Activity 1 **Identifying resources for teaching of maize production**

- 1 Brainstorm teaching and learning resources that can be used in teaching the topic “maize production”
- 2 Discuss the teaching and learning resources that can be used in teaching the topic “maize production”
- 3 Identify resources that can be used in teaching and learning different lessons on maize production

#### Activity 2 **Collecting resources for teaching maize production**

- 1 Walk around the school campus

- 2 Collect the resources for teaching maize production you identified in Activity 1
- 3 Request learners to bring some of the teaching materials

**Activity 3 Developing resources for teaching and learning of maize production**

- 1 Identify resources that you did not get in activity 2
- 2 Draw or model the resources

**Activity 4 Displaying teaching and learning resources for maize production**

- 1 Display the resources collected and created
- 2 Plan a gallery walk or bus stage or restaurant for others to appreciate.
- 3 Conduct peer assessment of the resources

**Tips**

- For Activity 1, you may use go the agriculture primary school syllabus or Teachers guide to know the different resources needed for maize production.
- For Activity 1, you may use Quick write, brainstorming, pair work

develop the required attitude. A practical approach in form of a project is ideal for teaching arable crops. Than in this task, you will prepare present and evaluate practical lessons done during project work.

**Activity 1 Preparing practical lessons on maize production**

- 1 Identify practical activities that can be used in teaching maize production.
- 2 Prepare practical lesson on maize production practices.
- 3 Peer review the planned lesson.
- 4 Improve your lesson.

**Activity 2 Presenting practical lessons on maize production**

- 1 Plan to peer teach a practical lessons on maize production
- 2 Review procedures for teaching practical lessons
- 3 Present the practical lessons

**Activity 3 Evaluating practical lessons using checklist**

- 1 Identify strengths in the lessons delivered
- 2 Identify challenges faced
- 3 Suggest solutions to the challenges

**Task 3 Applying appropriate methods in the teaching of arable crops**

The teaching of arable crops requires an appropriate strategy for the learners to acquire the knowledge, skills and

### Tips

- Use the school garden for presenting the lessons in Activity 2
- For Activity 2, you may consider the methods used, resources and assessment used lesson introduction, development and conclusion to identify the strengths and weaknesses.

#### **Task 4 Using innovative methods for assessing learners' work when teaching arable crop production**

Assessment forms part of the teaching and learning process. Results of assessment provide feedback on how well the teaching is going on. In this task you will develop and use appropriate assessment tools for a project on growing arable crops in a school garden.

#### **Activity 1 Developing assessment tools for teaching maize production using project method**

- 1 Review the different tools used to assess learners' work during practical lessons.
- 2 Explain how each tool is used. Identify the different skills that you want the learners to acquire during the practical lessons.

- 3 Develop assessment tools for assessing learners' work when teaching maize production using project method.

#### **Activity 2 Assessing learners work in a project on maize production**

- 1 Plan practical lesson on maize production.
- 2 Determine the skills to be acquired in the lesson.
- 3 Use the tools when assessing learners' work in a practical lesson at the demonstration school.
- 4 Assess the extent to which learners are able to display the intended skills.
- 5 Keep progress results of the individual learner's achievement.
- 6 Share your findings.

#### **Activity 3 Using assessment results to improve teaching and learning of maize production**

- 1 Study the progress record for learners' achievement.
- 2 Identify skills that have high and low achievement levels.
- 3 Identify learners with low achievement levels.
- 4 Suggest how you will use the results to improve your teaching and assist learners who are struggling.
- 5 Share your findings for comments.
- 6 Use the refined suggestions to improve your teaching.

### Tips

- For Activity 1, you may use checklist, rubric, test items or report as assessment tools.
- For activity 2, You may need progress books for keeping achievement levels for different practical lessons for the project work
- For Activity 3, practical lesson should be planned based on the project stage e.g. weeding, planting, harvesting stage.
- You may consider the following ways to improve teaching and learning:
  - revising of the activity/make up lessons
  - listing higher performing peers in demonstration skills
  - increase availability and quality of resources

### Summary

In this topic you have learnt critical concepts that a teacher must have in order to teach the topic on arable crop production. These concepts include factors to consider when choosing a crop to be grown in an area. The factors are soil characteristics, rainfall, temperature, availability of market and availability of inputs.

You also learnt crop production practices using maize production as a

case study. Crop production practices in growing maize include land preparation, planting, weeding, fertilizer application, pest and disease control, harvesting and marketing.

You also learnt that one of the resources for teaching growing of arable crops is the school garden. A teacher may need to use learners to collect other resources such as seeds, farm tools to ensure effective learning process

You further learnt that practical lessons help learners acquire skills. A practical lesson may focus on more than one skill. In teaching principles of crop production using practical lessons, focus on measurable skills. Resources should be adequate to allow learners practice the skills being taught. It is important to supervise the learners as they carry out the activities. In order to have more time for hands on practice, project method becomes ideal. In project method, learners do the activities during their free time and take a longer time depending on the period of growing the crop. Project work helps learners practice all production practices with the guidance of the teacher. The assessment tool such as checklist, rubric, written reports and test can be used to assess skills that learners acquire and are able to demonstrate.

### Reflection

- 1 Why should you assess learners work in a project?

- 2 How can a teacher use the assessment results to improve teaching and learning
- 3 Which resources can be stored in the school for teaching and learning of maize production?

### Assessment

- 1 Describe any four production practices when growing arable crops
- 2 What can a teacher do to ensure availability of resources for teaching the growing of arable crops?
- 3 Describe the procedure followed when delivering a practical lesson in crop production
- 4 Compare use of rubric and checklist when assessing learners' work in a project of growing arable crops.

### Glossary

**Project:** Activity to be done by students over a period of time while applying skills learnt in class, recording observations and reporting results in the end.

### References

Kanjala, B M. Kaperemera, NT. (2001). *Strides in Agriculture 2*. Longman: Blantyre.

Malawi Institute Education. (2008). *Initial Primary Teacher Education Agriculture Tutors Book*, MIE: Domasi.

Malawi Institute Education. (2010). *Initial Primary Teacher Education ODL Agriculture module 1*, DTED: Lilongwe.

Ministry of Agriculture. (2008). *Guide to agriculture production and natural resources management*, Agriculture Communication Branch: Lilongwe.

Malawi Institute of Education. (2014). *Ways of teaching and ideas for student teachers*, MIE: Domasi .

Malawi Institute of Education. (2015). *Critical thinking training manual for Malawi* MIE: Domasi.

Malawi Institute of Education. (2013). *Critical thinking source book for Malawi*, MIE: Domasi.

Migwi, J., Kimunduu, CN. & Njoroge L. (2006). *Premier golden tips Agriculture secondary school*, Moran: Nairobi

## TOPIC 8

# Teaching poultry production

**Time** 6 hours

**Term** 2

## Introduction

The primary school curriculum covers poultry production. As a primary school teacher you must be familiar with the content and different approaches of teaching, learning and assessing learners' work in poultry production. You also need to know how to develop resources for teaching effectively. This will enable learners to acquire the expected knowledge, skills and develop positive attitude towards livestock production.

In this topic, you will learn the production practices for poultry, chickens in particular. You will also be exposed to the approaches and resources that can be employed to teach and assess learners' work in the topic.

## Success criteria

By the end of this topic, you must be able to:

- Analyse concepts in poultry production taught in primary schools
- Investigate effective methods for teaching and learning poultry production

- Develop appropriate teaching and learning resources for poultry production
- Construct effective tools for assessing learners' work in teaching and learning poultry production
- Assess learners' work in poultry production

## Background information

Teaching poultry production covers importance, systems and husbandry practices in poultry production. It also covers teaching, learning and assessment resources in poultry production. Poultry production is a potential area where most learners after leaving their primary education may venture into for their living. It does not require a lot of space to produce compared to other enterprises. As a teacher, you may have the advantage in that most learners have seen their parents keeping poultry at home. However, poultry production faces challenges of low production due to poor management practices that result in high feed costs, parasite and disease outbreaks. This calls for your intervention as a teacher to help learners when they get into poultry production to optimize the potential.

## Tasks

### **Task 1 Analysing concepts on poultry production practices**

Poultry production is not a new topic for most of you based on your primary and secondary school education experiences. In this task you will reflect on your level of understanding of the concepts in poultry production and identify the levels of coverage in the primary school curriculum.

#### **Activity 1 Self-studying concepts of poultry production**

- 1 Review the concepts related to poultry production
- 2 Carry out an investigation on the concepts of poultry production.
- 3 Discuss your findings with friends and check for the gaps.

#### **Activity 2 Discussing production practices for poultry**

- 1 List down main husbandry practices in poultry production
- 2 Discuss major activities done under each production practice
- 3 Share your findings for discussion

#### **Activity 3 Analysing depth of coverage of poultry production in primary curriculum**

- 1 Find out from the primary school agriculture teachers guides and syllabuses the classes and level/depth of coverage of the poultry production concepts.
- 2 Compare your knowledge of poultry production with coverage of poultry

production in primary education curriculum

1. Report the findings in plenary

#### **Tips**

- Your investigation in activity 1 may target the following;
  - Types of poultry
  - Importance of poultry production
  - Systems of keeping poultry
  - Poultry management practices
- For Activities 1 and 2, you may use agriculture extension workers, nearby poultry farmers, textbooks and internet as source of information.
- For Activity 2 the discussion may focus on:
  - Feeding
  - Housing
  - Breeding
  - Parasite and disease control
  - Debeaking
  - Marketing functions

#### **Task 2 Investigating effective approaches for teaching and learning poultry production**

As a teacher, you need to facilitate the acquisition of the poultry production knowledge in learners. There are several methods you can use, however some are more appropriate than others.

This task will guide you to identify appropriate teaching and learning methods, prepare conduct and evaluate field trip.

**Activity 1 Identifying appropriate methods for teaching and learning poultry production**

1. Isolate methods that have been suggested in primary school syllabus for agriculture
2. Review the procedure for using the methods
3. Suggest other methods that could be used to teach the topic
4. Present your findings

**Activity 2 Discussing the use of field trip as a method for teaching poultry production**

1. Brainstorm the meaning of field trip
2. Discuss the importance of using field trip in the teaching of poultry production
3. Review the necessary procedures followed when using the method
4. Present your work

**Activity 3 Visiting a nearby farm to learn poultry production**

1. Plan a field trip
2. Visit the poultry farm

**Activity 4: Evaluating excursion**

1. Identify successes of the trip
2. Identify challenges faced during the trip

3. Write a report

**Tips:**

- You may reflect on use of field trip as taught in Foundation studies to facilitate its application to the teaching of agriculture.
- For Activity 4 you may consider the following when evaluating the trip
  - planning of the trip
  - how the procedures were followed
  - how the objectives of the trip were achieved.

**Task 3 Developing appropriate teaching and learning resources for poultry production**

Teaching and learning resources form an important part of the poultry production lessons. In this task you will design and develop teaching and learning resources for poultry production.

**Activity 1 Discussing appropriate resources for teaching and learning poultry production**

1. Reflect on the different lessons you were taught both in primary and secondary schools.
  - What kind of resources did the teachers use in teaching?



- How did they use them?
  - How did the use of such resources help your learning process?
2. Isolate the teaching and learning resources that have been suggested in the agriculture syllabus for poultry production
  3. Identify appropriate teaching and learning resources for poultry production
  4. Discuss how the resources identified can be used in teaching poultry production

**Activity 2 Developing appropriate teaching and learning resources for poultry production**

1. Which resources identified in Activity 1 can you easily find at a typical primary school?
2. How you would come up with the resources for teaching and learning poultry production you cannot easily find at a primary school?
3. Develop appropriate teaching and learning resources for poultry production
4. Modify some resources for the visually impaired learners.

**Activity 3 Displaying teaching and learning resources for poultry production**

1. Display the developed resources
2. Let other students appreciate your work in a gallery walk

**Tips:**

- Resources you may need include models, pictures, diagrams, charts or real objects
- Video clips for different types of birds, chicken houses and other aspects of the topic may be used
- You may need the teaching syllabus for primary school

**Task 4 Constructing effective tools for assessing learners' work in teaching and learning poultry production**

Assessment is vital for both the teacher and the learners. The teacher identifies challenges in the teaching and learning process so that improvements can be done while the learner benefits from the improved teaching and remediation received. In this task you will identify and construct tools for assessing learners' work.

**Activity 1 Discussing tools used for assessing learners' field work in poultry production**

1. Review the tools that you used to assess learners' field work in previous topics
2. Recall the differences and similarities between the tools
3. Present your work

### **Activity 2 Constructing assessment tools for practical lessons in poultry production**

1. Choose a practical lesson on poultry production
2. Identify measurable skills you want learners to acquire
3. Construct assessment tools you would use for assessing learners in the practical lesson

### **Task 5 Assessing learners' field work in poultry production**

You need to use the assessment tools that you constructed based on a real lesson. In this task, you will evaluate the assessment tools, identify the appropriate one and use it to evaluate learners' work at the demonstration school.

### **Activity 1 Evaluating assessment tools for field trip lessons in poultry production**

1. Identify strengths of the tools you have developed
2. Identify challenges of the tools you have developed
3. Identify the appropriate tool for assessing learners' work in the field trip.

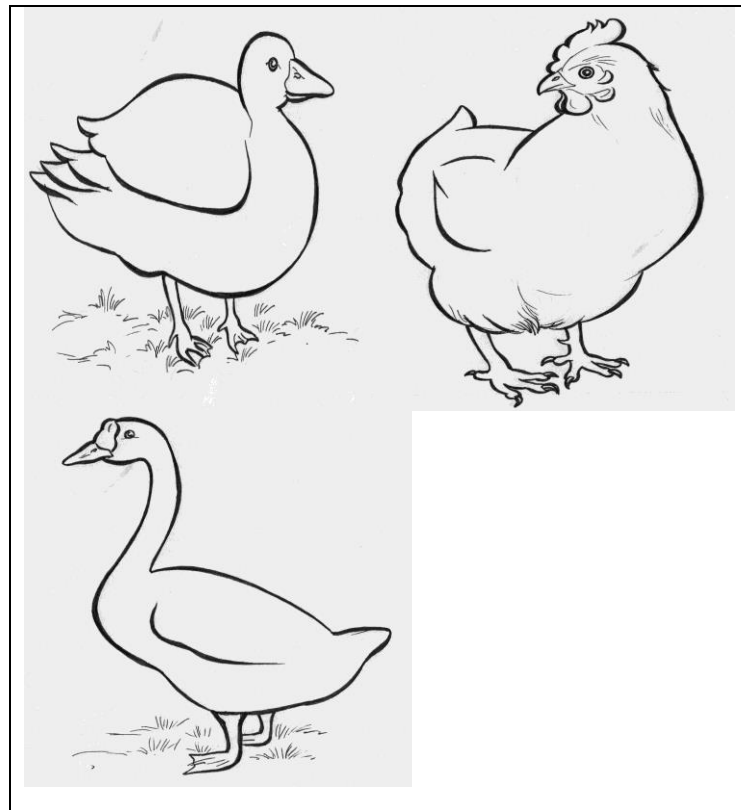
### **Activity 2 Assessing learners' field work for poultry production**

1. Using the lesson you developed for peer teaching in this topic, teach learners at the demonstration school

2. Assess learners' work using the tool you developed
3. Identify strengths and weaknesses of the assessment tool
4. Improve your assessment tool based on the observations

### **Summary**

In this topic, you have learnt that poultry means all the domesticated birds. In Malawi the common domesticated birds include chickens, pigeons, ducks, quails, geese, turkey and guinea fowls as shown in Figure 8.1.



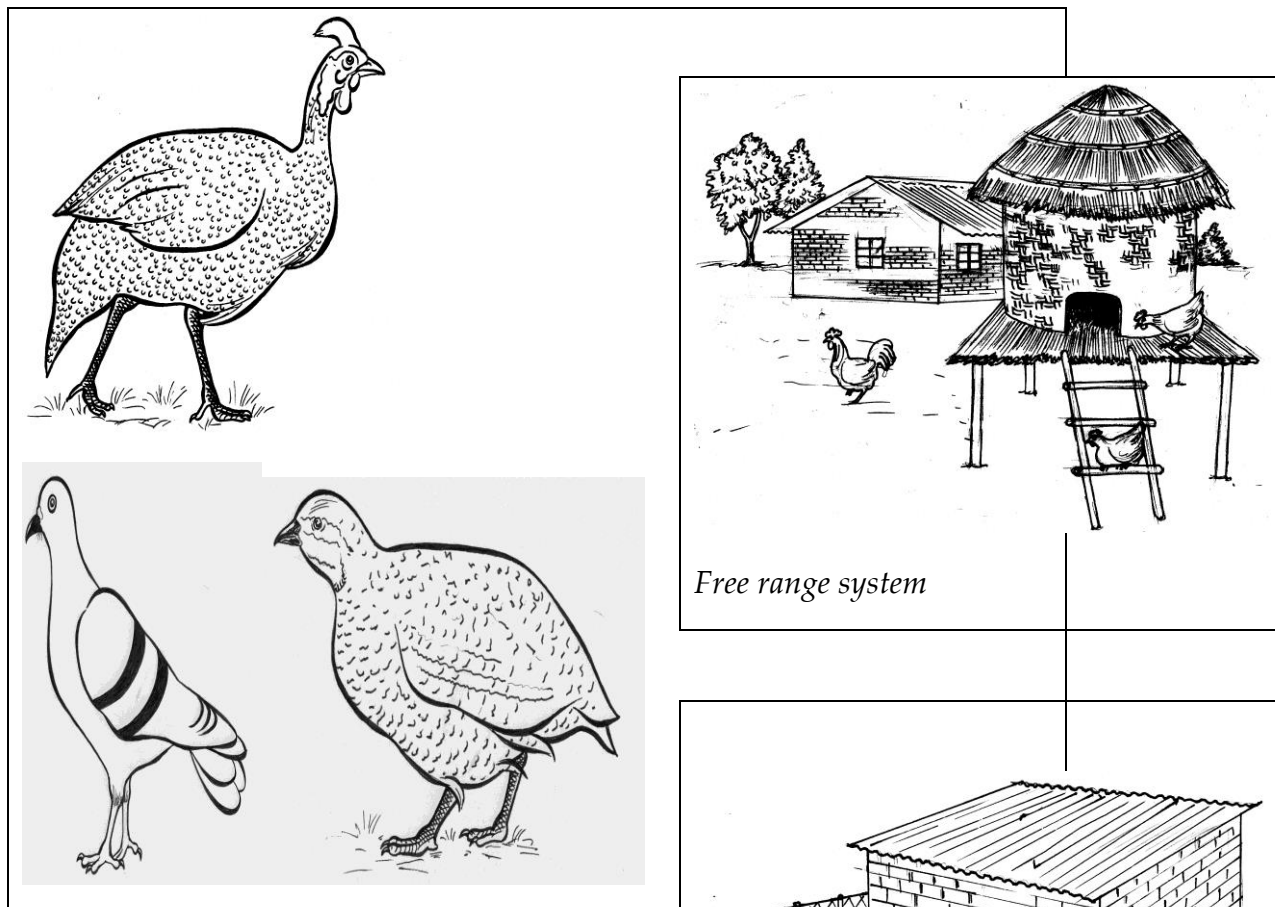


Figure 8.1: Domesticated birds

Poultry production is important for farmers in a way that it is a source of food to people, raw materials for individuals as well as agro-based industries, manure for crop production and employment.

You have also discussed that there are three systems of keeping chickens namely intensive, extensive and semi intensive. Chickens being the commonest poultry kept in Malawi can be raised in various systems depending on the scale of production and type of chickens based on purpose i.e. broilers, layers or both. Figure 8.2 shows different systems of housing poultry

Free range system

Semi-intensive system

Figure 8.3: Some systems of housing poultry

You further discussed that when raising chickens, there is need to follow important production practices to ensure high production that should be followed. These are proper housing, feeding, breeding, debeaking (layers), parasite and disease control. These

production practices must be followed to ensure high production.

You also discussed that when planning a field trip, you need to set aims and objectives. After setting objectives, select the site, contact the owner and prepare items and concepts to be studied. As a teacher you also need to assign responsibilities to students and establish code of conduct and safety measures. The farm owner needs to be notified of the number of learners, objective of the trip and date and time of the visit.

Finally, you have learnt that appropriate teaching and learning resources should be used to effectively teach primary school learners. There are different types of resources used when teaching poultry production. These can be grouped into;

1. **Real objects/realia**– these refer to the actual things, for example, cages, chickens, eggs, feathers, poultry feed, water troughs and parasites of poultry.
2. **Models** – these are made from clay, wires, grass, sticks or papier mache to represent the real object such as types of chickens, poultry houses.
3. **Pictures** – these are already drawn objects in newspapers, plastic jumbos, books and magazines.
4. **Charts** – these are illustrations on a large paper or empty sack in cases where a real object, model or picture is not available.

## Reflection

- 1 Compare the approach in the teaching of this topic to how you were taught in primary/secondary schools.
- 2 What concepts on poultry production do you know but have not been explored in this topic?
- 3 How vital is that information in (2) to the teaching of this topic?
- 4 How would you adapt the methods and resources for the visually impaired learners?
- 5 Did the assessment tools measure what you expected it to measure

## Assessment

- 1 Describe any four husbandry practices for poultry production
- 2 Describe the teaching, learning and assessment resources for use when teaching the topic “feeding of poultry”
- 3 What are the benefits of developing assessment tools in advance?

## Glossary

**Broilers** – chickens raised for meat production

**Layers** - chickens raised for egg production

## References

Malawi Institute of Education. (2007).  
*Malawi Primary Education  
Agriculture Teachers 'guide for  
standard 6*, MIE: Domasi.

- Malawi Institute of Education. (2007).  
*Malawi Primary Education  
Agriculture Learners' book for  
standard 6*, MIE: Domasi.
- Malawi Institute of Education. (2008).  
*Initial Primary Teacher Education  
Agriculture Lecturers' book*, MIE:  
Domasi.
- Malawi Institute of Education. (2008).  
*Initial Primary Teacher Education  
Agriculture Students' book*, MIE:  
Domasi.
- Ministry of Education, Science and  
Technology. (2010). *Initial Primary  
Teacher Education Agriculture  
(ODL) Module 3*, DTED:  
Lilongwe.
- [www.poultryhub.org](http://www.poultryhub.org) .the principles of  
poultry husbandry.
- [www.webcrawler.com](http://www.webcrawler.com). Poultry farm  
guide.
- [http://www2.ca.uky.edu/poultryprofitability/production\\_manual/chapter2\\_broiler\\_production\\_facts\\_and\\_figures/chapter2\\_litter\\_management.htm](http://www2.ca.uky.edu/poultryprofitability/production_manual/chapter2_broiler_production_facts_and_figures/chapter2_litter_management.htm)

## TOPIC 9

# Teaching pig production

**Time:** 4 hours

**Term:** 2

## Introduction

In topic 8, you learnt how to teach poultry production. Another topic under core element livestock production studied in primary school curriculum is pig production. In order to prepare yourself to teach and assess primary school learners in this topic, you need to acquire the knowledge, skills and develop positive attitude towards the teaching of pig production.

In this topic, you will study pig production practices. You will also study teaching, learning and assessment methods in pig production with emphasis on research. This will help you to effectively teach and assess learners the acquisition of knowledge, skills and change in attitude that will make them consider pig production as business in future.

## Success criteria

By the end of this topic, you must be able to:

- Investigate pig production practices
- Use appropriate methods in teaching pig production

- Assess learners' work when teaching pig production

## Background information

The teaching of pig production covers its basics and husbandry practices. It also covers the teaching and assessment strategies for pig production. Teaching of pig production will help learners to unlock the yield potential in pig production. Pigs are prolific breeders as such farmers easily get high returns from their investment, more meat is produced within a short time and they feed mainly on grain and grain by-products. Care should be taken as pigs easily get attacked by parasite and diseases and compete with human beings for feed. In order for the learners to acquire the knowledge and skills to be successful in this enterprise, it requires you as a teacher to facilitate the process.

## Tasks

### Task 1 Investigating pig production practices

As a teacher you must have adequate and relevant knowledge of the content being taught. You need to be creative in sourcing information as knowledge keeps on changing. A good teacher must be well updated in the emerging issues and technologies in the topic being handled. In the activities that follow you

will explore concepts on pig production using different sources of information.

### **Activity 1 Researching on pig production practices**

1. Brainstorm on pig production practices
2. Carry out an investigation on pig production practices
3. Write a report on pig production practices
4. Share your findings

### **Activity 2 Discussing pig production practices**

1. Discuss the findings on pig production practices in Activity 1.
2. Isolate the major activities in each of the pig production practices
3. Present your work

### **Activity 3 Isolating pig production practices taught in primary school curriculum**

1. Study the primary school agriculture teachers' guides, learners books and syllabus
2. Find out the specific concepts or topics on pig production by class and level of coverage.
3. Report the findings in plenary.

#### **Tip:**

- The information search in activity 1 on pig production practices may focus on: breeding, feeding, housing, parasite and disease control, identification, castration, culling and marketing of pigs and their products

### **Task 2 Using appropriate methods in teaching pig production**

Several methods have been suggested in the primary school agriculture syllabus for teaching pig production. This task introduces you to the use of a research method for teaching pig production in primary schools. You will also evaluate how the method has been used.

#### **Activity 1 Discussing research as a method for teaching pig production**

1. Review the meaning of research
2. Discuss where you can get information when conducting a research on pig production
3. Review the necessary procedures followed when using the method
4. Discuss how you can use research when teaching pig production
5. Present your work

### **Activity 2 Using research method in teaching pig production**

- 1 Develop a lesson plan on topic 'parasites and diseases of pigs'
- 2 Peer teach using research method
- 3 Evaluate the lesson

#### **Tip:**

- You may reflect on use of research as taught in Foundation studies to facilitate its application to the teaching of agriculture

### **Task 3 Assessing learners' work when teaching pig production**

To establish the achievement level of learners' performance in pig production, there is need to assess their work. This can be done by using applicable assessment tools. In this task, you will identify assessment tools and use them to improve teaching and learning.

#### **Activity 1 Identifying appropriate tools for assessing learners' work when teaching pig production**

- 1 Brainstorm tools for assessing learners' work when teaching pig production
- 2 Discuss tools used to assess learners' work when teaching pig production
- 3 Identify suitable tools for assessing learners' work when teaching pig production

#### **Activity 2 Using appropriate tools for assessing learners' work when teaching pig production**

- 1 Develop lesson plans on any concept on pig production
- 2 Conduct micro-teaching on the concept
- 3 Assess learners' work using the identified tools

#### **Activity 3 Using assessment results to improve teaching and learning in pig production**

- 1 Identify challenges faced in teaching and learning using the assessment tools used in Activity 2
- 2 Suggest solutions to the challenges
- 3 Present your work for discussion
- 4 Use the refined suggestions for improvement in the next lesson

#### **Tip:**

- For Activity 3, you may identify challenges you faced as a teacher and challenges the learners faced in attaining the knowledge and skills

### **Summary**

In this topic you have looked at concepts on pig production. Pig production is a more profitable



agricultural enterprise which needs sound investment and proper production management practices. Proper management practices in pig production include housing, feeding, breeding, parasite and disease control, culling and castration. The common breeds of pigs raised for commercial purposes are the Large White, Land Race and their crosses with the indigenous species. Figures 9.1 to 9.3 show some examples of breeds of pigs.



*Figure 9.1: Land Race pig*



*Figure 9.2: Large White pig*



*Figure 9.3: Large Black pig (indigenous)*

You have also learnt that pigs are monogastric animals and are fast growers due to their ability to convert concentrate feed to meat twice as efficient as ruminants. They basically feed on concentrates, mainly cereal by-products. Most subsistence pig farmers keep them on free range system. Under this system pigs are only housed at night and find their own feed during the day/

You further discussed that the topic can best be taught by exposing learners to the ideal situations through different methods such as research, project and field trips to observe the production practices. Appropriate assessment methods and resources should be used to check the effectiveness of the teaching and learning processes.

## Reflection

- 1 What new things have you discovered from the investigation?
- 2 What challenges would you face when teaching the concepts on pig production?
- 3 How would you handle such challenges identified in (2)?
- 4 What resources would you consider making available for the teaching, learning and assessing learners' work in pig production?

## Assessment

- 1 In what ways are pigs more profitable than cattle?
- 2 What are the challenges in pig production enterprise?
- 3 Discuss factors to consider before engaging in pig production?
- 4 Discuss any three tools you would use to assess learners' work when teaching pig production using a research.

## Glossary

**Castration:** Removal of the male reproductive organs

**Culling:** Removal of unproductive livestock.

**Identification:** Assigning a unique symbol to a livestock

## References

- FAO (2009). Farmers Handbook on pig production for smallholders at village level. Available at [www.slideshare.net/growelagrov/farmers-handbook-on-pig-production](http://www.slideshare.net/growelagrov/farmers-handbook-on-pig-production). Last accessed 10 May, 2017.
- [Phiri](#) R.E. (2012). *Determination of piggery business in Balaka district in Malawi*. Livestock for rural development, volume 24. Article #147. <http://www.irrd.org/irrd2418/phir24147.htm>. Last accessed 12 May, 2017.
- [www.porkcares.org/our-practices/sustainability-in-modern-pig-farming](http://www.porkcares.org/our-practices/sustainability-in-modern-pig-farming). *Sustainable pig farming practices*.
- [www.fao.org/ag/againfo/themes/documents.Farmers](http://www.fao.org/ag/againfo/themes/documents.Farmers) *Handbook on Pig Production*.