CLIMATE CHANGE ADAPTATION

A manual for trainers

Muscovy Duck Farming systems in Papua New Guinea

Supported by the European Union

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Acknowledgements

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Introduction

This training module serves the purpose of guiding a trainer to train duck farmers. There are 9 different sessions with a summary of all the sessions at the end. Participants will also be given time at the end to give a brief feedback and prioritize future training in a form of voting.

Each of the sessions have activities and are arranged in a participatory approach i.e.

- participants will be given time to share their own experience and give feedbacks
- participants will be involved in practical sessions with technical staffs
- Participants will also be allowed to visit existing farm settings

Please don't start a training without reading –

Training villagers in PNG!

You can download a copy here-

http://gutpela-png-gaden.net/library/record/view/id/43

Muntwiler and Askin, 2004. Training villagers in PNG - a manual for trainers.

Remember, training is much more than giving technical information. The Muntwiler and Askin manual will provide lots of useful information to assist the process of your training.

TrainingObjective

To transfer basic skills and knowledge on Muscovy duck farming systems to improve Muscovy duck production at rural households through training of trainers.

Training Sessions

Timetable	Day before		First Day		Second Day	Third Day	Fourth Day
0800→0810h			Welcome (Devotion)		Recap (Devotion)	Recap (Devotion)	Recap (Devotion)
0830-1000h		1	Session 1:- Introduction (Part 1)	5	Session3:-Feeding and Watering (Part 1)	Session 5:- Eggs Incubation and Hatching	Session8:- Welfare, Health and Diseases
10-1030			Break		Break	Break/	
1030→1230		2	Session 1:- Introduction (Part 2)	6	Session 3:- Feeding and Watering (Part 2)	Session 6:- Brooding	Session9:-Farm Records
1230→1330			Lunch		Lunch	Lunch	Lunch

Time	Day before		First Day		Second Day	Third Day	Fourth Day
1330→1500		3	Session 2:- Housing	7	Session 4:- Breeding	Session 7:- Growing and Rearing	Summarising the day, Questions, suggestions, evaluation.
1500-1530	Gather		Break		Break		
1530-1630	People travel and gather	4	Summarising the day, Questions, suggestions, evaluation.	8	Summarising the day, Questions, suggestions, evaluation.	Summarising the day, Questions, suggestions, evaluation.	Closing

Session 1: Introduction

In this first session of the training, your participants are going to;firstly introduce yourselves especially on your personal backgrounds, and after this you all are going to participate inconstructing training ground rulesas these will be used to guide you through all the training sessions. Followed by sharingyour farming experiences.

Farmers will →

- Know each other
- Construct the training ground rules
- Identify and prioritize training needs
- Develop the training plan

Thinking and discussing together

- Give a general introduction of my personal background (not about my farming experience).
- Tell others what I currently have and do on my farm.
- Express what I want to learn and gain at the end of the training.
- Contribute points to make a set of training rules to guide each session's activities.
- Share my farming experience and situations.
- Identify and list my training needs.

Session 2: Housing

Introduction


Muscovy duck

Housing is a vital requirement inMuscovy duck farming as well as inevery other livestock species under any farming environment.Housing plays an important role in controlling environmental factors that affect productivity and efficiency of the ducks. A good housing provides protection from extreme weathers that could cause ducks to die and affecting their growth and performances. It also keeps ducks safe during nights and away from predators and safeguards ducks from pest and diseases problems. Housing also makes it easier to carryout husbandry practices such as feeding, egg collection, culling and etc.

The focus of this session will only be on importance of housing and the advantages that are associated with good housing.

The learning process will go by the order of the activities, starting with notes taking, discussions and questions and ending with farm demonstrations.

Tip-

A good house is one that protects ducks and provides a safe environment for good performance

Farmers will →

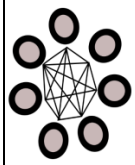
- Understand the importance and role of duck housing
- Know the important points that one needs to consider when building a duck house
- Identify problems associated with duck housing
- Describe a suitable duck house

Notes on

- Importance of Muscovy duck housing
- Points to consider when one tries to build a duck house
- Site selection
- Location of duck house
- Type of duck house
- Ventilation
- Air Quality
- Flooring and
- Spacing

Working together

Explain the current set up of your own duck house



Discussions

Discuss together.

Is your area suitable for farming duck?

Is your duck house suitable for sheltering your ducks?

Are some of these important points discussed not considered when building your duck house?

Can you still be able to rectify them?

Farm visit

- Take the farmers to a duck house;
- let them have a look around in it and get them to explain the important points about a suitable duck house.

Session 3: Feeding and Watering

Introduction

Feeding is one of the very important husbandry practices in duck farming. Through feeding, ducks obtain nutrients (energy, protein, vitamins and minerals) that are beneficial for their bodies' growth, performances and health. These nutrients are mainly sourced out of human food materials derived from plant and animal origins. To make a balanced and good feed, these materials are collected and put together, processed and combined or mixed according to duck feed nutritional level and at required amounts then provided to ducks. The feed can be presented in pellet or mesh forms but in most cases under village situations mesh form is suitable.

Tip-

Clean water is vital and it is as important as feed

Water also is an essential requirement that always goes together with feed. It helps control body temperature and is necessary for most metabolic reactions in the body. A pond or running stream as well is good for ducks to swim and clean themselves.

The focus of this session will only be on importance of duck feeding and watering, feeding systems, feed types, feed processing and feed making.

The learning process will go by the order of the activities, starting with notes taking, discussions and questions and ending with farm demonstrations.

Farmers will →

- Understand the importance of duck feeding and watering
- Know the types of duck feeding systems
- Identify problems associated with poor feeding systems
- Know the feed processing steps and
- Make duck village appropriate duck feed

Activities:

Notes on

- Importance of duck feeding and watering
- Types of duck feeding systems
- Feed Types
- Feed Processing and making
-

Working together

- Identify the types feeding systems used in my farm

Discussions

- Discuss together.
- How do you feed your ducks?
- What do you feed your ducks with?
- Where do you source your feed?
- Do you experience any problems with your duck feed?
- What do you do when you have feed problem?

Demonstration

- Organise farmers to bring locally available feed ingredients
- Demonstrate feed processing steps.
- Feed making

Session: 4 Breeding

Muscovy duck and drake mating

Introduction

In a smallholder Muscovy duck farming set-up, breeding is normally considered as a practice to select the best male and female ducks and mate them to reproduce off springs with desired traits. A duck farm can only sustain its production if it has a reliable source for obtaining new and replacement stocks. Farmers can breed their stocks on farm and also source from other reliable sources outside of the farm. To obtain good breeding stocks on farm, it is proper for the farmer tok now the basic breeding management practices and carryout them out correctly in order to achieve high production of new stocks.

Tips-

The basic breeding management practises are important to obtain good stock.

The focus of this session will only be on basic breeding management practices.

The learning process will go by the order of the activities, starting with notes taking, discussions and questions and ending with farm demonstrations.

Farmers will →	
	• Understand the importance of breeding stocks • Appreciate the management aspects of Muscovy duck breeding • Implement breeding management practices on farm •

Activities:

Notes on

- Importance of breeding ducks
- Basic management practices of breeding stocks
- Selection criteria of good breeding stocks
- Mating ratio
- Nests
- Lighting
- Egg Collection and Handling

Working together

- Name some problems that affect your breeding stocks.

Discussions

- Do you breed your own ducks or source from outside?
- Are you able to continuously replenish your breeding stock? If not why?
- How long does it take you to replace your breeding stock if you don't produce on farm?

Field visits

Go to a duck farm and have the farmers do selection of breeding stocks (duck and drake)based on selection criteria.

Session 5 Egg Incubation and Hatching

Muscovy duck sitting eggs

Eggs in the incubator

Artificial incubator

Introduction

Egg incubation is the process that involves warming up or applying of heat on fertile eggs to help them hatch out successfully. Eggs can be incubated naturally and/or artificially. In the natural way, broody ducks naturally accept the eggs and sit on them, cover them up with their feathers and bodies and in doing so, their bodies provide the necessary environmental conditions specifically; temperature, humidity and ventilation which are then regulated by the natural set up of their bodies to help the eggs hatch out successfully.Whilst with the artificial method, only clean and good sized eggs are prepared and placed into incubator machine by the hatchery worker for hatching. Prior to and during incubation

of eggs under artificial incubation, the temperature, humidity and ventilation are considered to be the three very most important determinants of successful hatching and have to be correctly adjusted at required levels and monitored right through the incubation period.

Tips-

-Understand the behaviour of the ducks.

-Provide adequate water and feed for broody ducks

-Provide Warm, dry, well ventilated nest box

The focus of this session will only be on Importance of egg incubation, types of incubation methods and natural incubation.

The learning process will go by the order of the activities, starting with notes taking, discussions and questions and ending with farm demonstrations.

Egg incubation and hatching

Farmers will →

- Understand the importance of egg incubation
- Know the types of incubation methods
- Learn about natural method and processes involved
- Demonstrate egg setting processes
-

Activities:

Notes on

- Importance of egg incubation
- Types eggs incubations
- Natural incubation processes and required environmental conditions

Working together

Identify farmers who hatch their own ducklings on farms to share with others how they incubate their duck eggs

Discussions

- What is your hatching rate?
- Do you have some problems during incubation?
- What are they?
- Have yousought information from some reliable sources to help you understanding the incubation processes and improve the hatching rates?

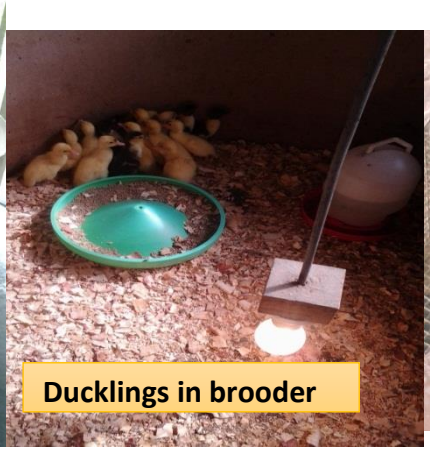
Field visits(Group)

Visit a farm and take the farmers through the natural incubation processes.

Get the farmers select good fertile eggs and set them under the broody ducks.

Session: 6 Brooding


Brooder


Ducklings in brooder


Ducklings in cage

Tips-

A good brooder is the one with: good warmth , enough feed and water available, good bedding, good ventilation and space

Introduction

Brooding refers to the period immediately after hatch when special care and attention must be given to chicks to ensure their health and survival. Recommended brooding period for duckling is from day old to 6 weeks of age. Brooding can be provided naturally and/or artificially. Natural brooding is when broody ducks hatch out ducklings and take care of them themselves whereas with artificial brooding; the ducklings are kept away in a small confinement built in the brooder house and provided with all the necessary requirements specifically, right amount of heat, balance feed, clean fresh water, good bedding, good air quality and etc. to make them grow strong and healthy to reduce mortality.

The focus of this session will only be on the importance of brooding, types of brooding methods, artificial brooding methods and its management.

The learning process will go by the order of the activities, starting with notes taking, discussions and questions and ending with farm demonstrations.

Farmers will →

- Understand the importance of duckling brooding
- Differentiate between natural and artificial brooding
- Understand the artificial brooding and its basic management
- Construct an artificial brooder on farm using local materials

Activities:

Notes on

- Importance of brooding
- Types of brooding systems
- Artificial brooding and its basic management

Working together

- Describe the type brooding method you normally used in your farm

Discussions

- What type of brooding method best suits you?
- Why do you use this method?
- Do you face any problems with it?
- What are they?

Field visits

- Visit a nearby farm and get the farmers to construct an artificial brooder using the available materials they have.

Session: 7 Growing or Rearing

3 weeks old ducklings in hanging cage

2 months old ducks raised on concrete floor

3-4 months old ducks raised under range system

Introduction

Normally rearing period of the young Muscovy ducks begins at 6 weeks of age after brooding period. During this period the farmer ensures uniform growth of the stocks to produce strong and healthy birds. The young ducks from there are allowed to feed on any locally available feed stuff that is provided. Also at this time the farmer decides on what to keep and what to sell then decides on the type of the rearing system to use.

Muscovy ducks are reared for both egg and meat production. Usually in PNG villages, smallholder duck farmers reared their ducks under free running system where the ducks are allowed to roam over large area of unfenced land in search of food during day time but with no shelters to house them during night and bad weathers. However, today many smallholder farmers have come to realise the importance of housing and feeding and have started raising their ducks under range system. Only commercial farmers are able to rear their ducks under intensive system.

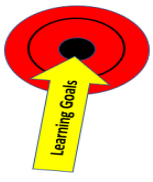
Tips- Provide -

- A good house and housing;
- Plenty of feed and water;
- Have a good understanding of the duck's behaviour

The focus of this session will only be on the types of rearing systems and their disadvantages and advantages.

The learning process will go by the order of the activities, starting with notes taking, discussions and questions and ending with farm demonstrations.

Farmers will →



- Differentiate between the types of rearing systems
- Know the advantages and disadvantages of the rearing systems
- Identify the suitable rearing system for village condition

Activities:

	**Notes on** • Types of rearing systems • Advantages and disadvantages of rearing systems used
	**Working together** • Describe the type of common rearing system used in the village
	**Discussions** • What are some of the problems you encountered under this common rearing system? • Can you name a common one?
	**Field visits** • Visit a farm that practices free running system and get the farmers to identify some of it major problems

Session 8 Welfare, Health and Diseases

Introduction

Duck welfare and health are two different principles of livestock production but have the common aim to protect and prevent ducks from factors that affect their productivity and efficiency. Good health is a prerequisite of an animal's welfare. Welfare embraces both physical and mental wellbeing of a duck during its production life. If a duck is not handled properly or not well looked after, then it is said to be mistreated and that makes it becomes stress. In practice, stress is indicated by pain, fright, nervousness and general discomfort.

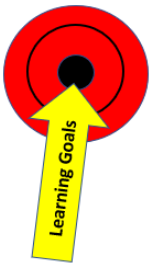
Tips-

Welfare and health: common aim is to protect and prevent ducks from factors that affect their productivity and efficiency.

With health, it is referred to as a condition where ducks attain acceptable level of production under farming systems. Diseases occur only when the ducks' health become affected. There are a number of factors that affect ducks health and make them become sick and they are; pathogens, poor care and nutrition, poor environmental conditions and hereditary.

The focus of this session will only be on the importance of duck welfare and health, common welfare issues affecting ducks, common factors affecting ducks health and the common diseases of Muscovy ducks and their control and preventive measures.

The learning process will go by the order of the activities, starting with notes taking, discussions and questions and ending with farm demonstrations.

Farmers will →	
	• Understand the importance of duck welfare and health • Differentiate between welfare and health • Know common welfare and health issues of ducks • Identify common duck diseases and their control and preventive measures •

Activities:

	**Notes on** • Importance of duck welfare and health • Common welfare and health issues of ducks Common duck diseases and their control and preventive measures
	**Working together** Identify some common duck diseases in your farms
	**Discussions** • Explain some welfare and health issues experienced at your farm • Are you able to manage them? • What do you do when you are not able to do so?
	**Field visits** Visit a farm to identify some welfare and health issues Demonstrate proper handling of ducks Demonstrate and explain on-farm bio security measures.

Session: 9 Basic Farm Records

Muscovy duck egg production record

MUSCOVY DUCKS WEEKLY RECORD SHEET:

Date start
Paddock
No.

Day	No. of Birds				Daily Egg Collection			Feed Offered	Remarks
	Duck	*Drake*	*Mortality*	*Total*	*Morning*	*Afternoon*	*Total*		
Mon									
Tue									
Wed									
Thur									
Fri									
Sat									
Sun									
Total									

Introduction

Farm records are usually written documents containing detailed descriptions of different farm activities occurring during farm operations. Farm records play very significant roles in any farm operations because they help farmers keep track and monitoring progress of farm.

Tips-
Keeping track and monitoring farm progress is very important for a successful farm operation

Farmers depend on farm records to obtain enough information needed for proper planning and management of the farm. There are two main types of farm records a farmer should keep to run a successful farm. They are namely physical and financial records.

The focus of this session will only be on the importance of farm records and different types of physical farm records.

The learning process will go by the order of the activities, starting with notes taking, discussions and questions and ending with farm demonstrations.

Farmers will →	
	• Understand the importance of keeping physical farm records • Know the different types of physical farm records • • •

Activities

	**Notes on** Importance of farm records Types of farm records
	**Working together** Get farmers to illustrate the types of records they keep
	**Discussions** • Discuss the types of records they keep and explain why they keep them for
	**Field visits** Visit a nearest farm to see what records the farmer has and establish farm recording system, mainly on physical records such as; • Daily farm records • Feed records • Egg production records & • Etc.

Session: 10 Drought and ducks

Introduction

Any environmental problem will have effects on the duck physiology and will affect its performance. Drought is a period of dryness especially when prolonged; specifically one that causes extensive damage to crops and survival of livestock with less or no water and feed availability.However, this does not limit the farmer from raising and maintaining ducks for meat or eggs. There are some ways that farmers can do to be able to continue raising and maintaining ducks.

The focus of this session will only be on some ways of keeping duck before drought; during drought; and after drought.

The learning process will go by the order of the activities, starting with notes taking, discussions and questions and ending with farm demonstrations.

Farmers will →	
	• understand some ways of maintaining duck flocks before, during and after drought

Activities

	Notes on
	• before drought: • Keeping a good record of the flocks i.e. know your best performers (egg production, brooding, breed) • Process feed when you have abundance • When drought is predicted the wise farmer will sell stock early to get a good price while their birds are in top condition. • Collect external information on the drought (predicted time of drought) • Sell some of flock but maintain your breeding flock (1 drake and 4-5 ducks). • Send your breeders to other villages where drought is not severe. • Keep male and female ducks away from each other to avoid mating • After drought -Maintain the ducks with good feed and water • Have a good breeding program i.e. start less and increase as you go along

Working together

Pot in pot demonstration for keeping duck eggs cool

Discussion regarding drought strategies

- What are the ways your farmers can prepare for drought?

Summary and feedback

Notes on

Muscovy duck is recommended to be an ideal poultry breed for both meat and eggs production under PNG condition after village chickens as both are affordable by poor members of society due to their hardiness and easy to manage with least cost. Rural households primarily keep Muscovy ducks for their own consumption and sell surplus for cash to meet their family needs and wants. They also keep ducks for social and customary obligations. Above all, Muscovy duck plays a very significant role in contributing towards enhancing food security, health status and nutrition in diets of rural families.

For a smallholder duck farmer to be successful, the basic management and husbandry skills on Muscovy duck farming are required. These basic practices include; *housing, feeding and watering, breeding, egg incubation and hatching, brooding, rearing and growing, welfare health and diseases, and basic farm records.*

Upon completion of this training, the participants should be able to be equipped with the skills and knowledge on these basic practices learnt.

- Housing provides protection from extreme weathers that could cause ducks to die and affecting their growth and performances. It keeps ducks safe during nights and away from predators and safeguards ducks from pest and diseases problems. It also makes it easier to carryout husbandry practices such as feeding, egg collection, culling and etc.
- Feeding makes necessary nutrients (energy, protein, vitamins and minerals) in the feed available to the ducks for their bodies' growth, performances and health. A good balance feed with clean water is essential every day.
- Breeding is considered as a practice to select the best male and female ducks and mate them to reproduce offspring with desired traits. A duck farm will only rely on good breeding stocks to improve and sustain its production.
- During egg incubation and hatching processes, successful hatching rates of chicks can only be obtained through proper eggs grading, sanitation, and storage prior to incubation, correct levels of temperature, humidity and ventilation set and maintained with undertaking candling and turning of eggs right through incubation period.
- Brooding refers to the period immediately after hatch when special care and attention must be given to ducklings to ensure their health and survival. Brooding starts from day old to 6 weeks of age. During brooding, ducklings and provided with all the necessary requirements specifically, right amount of heat, balance feed, clean fresh water, good bedding, good air quality and etc. to make them grow strong and healthy to reduce mortality.
- Normally rearing period of the young Muscovy ducks begins at 6 weeks of age after brooding period. During this period the farmer ensures uniform growth of the stocks to produce strong and healthy birds. A farmer decides on what to keep and what to sell then decides on the type of the rearing system to use.

- Duck welfare and health have the common aim to protect and prevent ducks from factors that affect their productivity and efficiency. Good health is a prerequisite of an animal's welfare. Welfare embraces both physical and mental wellbeing of a duck during its production life. Health is referred to as a condition where ducks attain acceptable level of production under farming systems. Diseases occur only when the ducks' health and care become affected.
- Farm records play very significant roles in any farm operations because they help farmers keeping track and monitoring progress of farm. Farmers depend on farm records to obtain enough information needed for proper planning and management of the farm.

Working together

- The participants views and feedback on the training
- Indicate your priority areas for the training and needs for future training.
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Discussions

- Vote on your needs

Future training needs and prioritization: table 1

- Priority must be given to women voting

Table 1: Title and Purpose – to be decided on together.

Activity/Topic	Women's Vote	Men's Vote	Total	Prioritization
Housing				
Feeding & Watering				
Breeding				
Egg Incubation				
Brooding				
Growing & Rearing				
Welfare, Health & Diseases				
Basic Farm Recording Systems				
Other topics?				

Other topics				

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