



# Climate Smart Agriculture Technologies, Innovations and Management Practices for Indigenous Chicken Value Chain

## TRAINING OF TRAINERS' MANUAL



Alaru P.A.O., Ouko V.O., Wachira A.M., Ngaira V.M., K'Oloo T.O., Mungube E.O., Adongo A., Mutisya W.M., Kipronoh K.A., Makelo M., Wambua S.M., Maichomo M., Murage A., Ndubi J., Mwangi D.M., Nyambati E.M., Munyasi J., Mbuku S.M., Changwony D. and Ilatsia E.D.

**DECEMBER 2023**





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## FOREWORD

The Kenya Agricultural and Livestock Research Organization (KALRO) through the Kenya Climate Smart Agriculture Project (KCSAP) and National Agricultural and the Rural Inclusive Growth Project (NARIGP), laid a strong foundation for commercialization of agriculture in Kenya. This was done through the development of Climate Smart Technologies, Innovations and Management Practices (TIMPs) and Training of Trainers (ToTs) manuals for 27 value chains through KCSAP and 5 value chains through NARIGP as well as the accompanying training for the master trainers for the two projects. During this phase, KALRO conducted 51 adaptive and 80 applied research projects through which additional TIMPs were developed and validated, with some of the research gaps identified earlier addressed. A notable inclusion was the use of the Big Data Platform to integrate digital information from value chains.

The National Agricultural Value Chain Development Project (NAVCDP) seeks to build on and deepen investments into interventions on productivity enhancement, community-led farmer extension, water management investments and data-driven value chain services from the two earlier projects. In this project, KALRO seeks to reinforce, customize and update the existing inventories of TIMPs, with emphasis on climate resilience, nutrition, and safer food production practices. With the continued support, KALRO also is poised to continue providing quality technical assistance for value chain development at all levels and build capacity of county level implementation units to anchor project activities. With the support of NAVCDP, KALRO has developed TIMPs for the two new value chains, pyrethrum and rice and is continuously updating inventories of TIMPs for all other value chains developed during the implementation of KCSAP/NARIGP. In doing so, KALRO further strengthens climate resilience and enhance value addition aspects of the updated TIMPs. The organization continues to support the strengthening of the existing Big Data platform at KALRO as the foundational database for insight-driven, more productive, resource efficient and climate-resilient farming. To enhance the effective coordination of research linkages and agriculture digitization, KALRO and the Ministry of Agriculture and Livestock Development have put in a relevant support mechanism to oversee the implementation of these activities.

Extensive information from research and background data has been used to update the Indigenous Chicken TIMPs inventory. To disseminate the TIMPs, this Training of Trainers' Manual has been updated. The manual takes into consideration the background, training content, training design and the facilitators' guidelines in the modules. The two-part manual consists of an introductory Part I that guides on how to use the manual and Part II that comprises the training modules. The training modules have uniform outline that ensures every aspect of the TIMPs are fully covered in a way that the trainees can relate to. Various delivery methods are employed and where possible demonstrations and practical work are incorporated to enable the trainees to learn by participating in the actual field activities. The manual seeks to enhance market participation, value addition and link agriculture to nutrition education through

comprehensive coverage of relevant information that provides for these needs. The use of this Training of Trainers' Manual is expected to contribute to the achievement of the Project Development Objective (PDO), which is to increase market participation and value addition for targeted farmers in select value chains in project areas. This Indigenous Chicken ToT Manual should be used in conjunction with the respective TIMPs inventory.

Finally, I am greatly indebted to the value chain leaders and all those who participated in the preparation of this Indigenous Chicken ToT Manual, which is expected to herald new ways of delivering training content in a changing agricultural environment.

Eliud K. Kireger, PhD, OGW  
**Director General, KALRO**



## PREFACE

The National Agricultural Value Chain Development Project (NAVCDP) is a Government of Kenya project with support from the World Bank. The five-year project is being implemented in 32 counties clustered in seven regions at an approximate cost of US\$ 275 million. The project development objective (PDO) is “increase market participation and value addition for targeted farmers in select value chains in project areas.” It is expected that this objective will be achieved through implementing the five project components, namely; Building Producer capacity for climate resilient stronger value chains; Climate Smart Value Chain Ecosystem Investments; Piloting Climate Smart Safer Urban Food Systems; Project Coordination and Management; and Contingent Emergency Response Component.

The National Agricultural Value Chain Development Project aims to support 3.8 million small-scale farmers transitioning or with the potential to transition from subsistence farmers to commercial farmers or are selling only a small percentage of their produce commercially. Additional beneficiaries of the Project include value chain actors at various levels, the extension workers, aggregators, logistics support providers and SMEs operating within the value chain. The Project places a strong focus on inclusion of women farmers within the supported Value Chains (VCs). Thirteen VC’s have been selected based on a thorough qualitative and quantitative assessment of their potential. The selected VCs based on their ranking are: Dairy, Coffee, Chicken, Avocado, Banana, Mango, Irish potatoes, Tomato, Apiculture, Pyrethrum, Cashew nut, Rice and Cotton. Additional value chains prioritized by counties will be supported by their respective County Project Coordination Units.

The National Agricultural Value Chain Development Project has partnered with KALRO to further strengthen and expand the existing inventory of TIMPs with emphasis on climate resilience, nutrition, and safer food production practices. Through this partnership, KALRO has been funded to develop Technologies, Innovation and Management Practices (TIMPs) for the two new value chains-Rice and Pyrethrum, and update inventories of TIMPs for all other value chains developed during the implementation of KCSAP/NARIGP and their corresponding Training of Trainers’ Manuals. It also supports the strengthening of the existing Big Data platform at KALRO as the foundational database for insight-driven, more productive, resource efficient and climate-resilient farming. Finally, the Ministry of Agriculture, Livestock Development (MoALD) has put in place relevant support mechanism with KALRO to oversee effective implementation, coordination of research linkages and agriculture digitization.

In updating this Indigenous Chicken ToT manual, KALRO and its partners used available information resources. Consequently, the use of these information resources, coupled with the accompanying training and contribution of the other project components, will go a long way in enabling NAVCDP to meet its development objectives.

The National Project Coordination Unit is grateful to all who participated in the development and production of this updated ToT Manual for Indigenous Chicken Value Chain. It is my hope that counties and stakeholders will put this resource to good use as they transform and reorient the agricultural sector, to make it more productive and resilient, while minimizing GHG emissions under the new realities of climate change.

Samuel Guto, PhD

**National Project Coordinator**

**National Agricultural Value Chain Development Project**





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## ABBREVIATIONS AND ACRONYMS

<b>AIP</b>	Agricultural Innovation Platform
<b>AMR</b>	Antimicrobial Resistance
<b>AMU</b>	Antimicrobial Use
<b>ASAL</b>	Arid and Semi-Arid Lands
<b>ASHE</b>	<i>Aloe Secundi</i> -Flora Herbal Extract
<b>BSF</b>	Black Soldier Fly
<b>CCPs</b>	Critical Control Points
<b>CCT</b>	County Coordination Teams
<b>CIAT</b>	Central Internacionale de Agricultura Tropical
<b>CIG</b>	Common Interest Group
<b>CPCU</b>	County Project Coordination Unit
<b>CSA</b>	Climate Smart Agriculture
<b>CTT</b>	Core Team of Trainers
<b>FFBS</b>	Farmer-Led Field Business Schools
<b>GAP</b>	Good Agricultural Practices
<b>GHG</b>	Green House Gas
<b>HPAI</b>	Highly Pathogenic Avian Influenza
<b>IBD</b>	Infectious Bronchitis Disease
<b>IC</b>	Indigenous Chicken
<b>IPPM</b>	Integrated Production and Pest Management
<b>KALRO</b>	Kenya Agricultural and Livestock Research Organization
<b>KCSAP</b>	Kenya Climate Smart Agricultural Productivity
<b>LESA</b>	Livestock Ecosystems Analysis
<b>LFs</b>	Lead Farmers
<b>MoALD</b>	Ministry of Agriculture and Livestock Development
<b>MR-SA</b>	Methicillin Resistant <i>Staphylococcus Aureus</i>
<b>NARIGP</b>	National Agricultural And Rural Inclusive Growth Project
<b>NAVCDP</b>	National Agricultural Value Chain Development Project
<b>NCD</b>	New Castle Disease
<b>NEMA</b>	National Environmental Management Authority
<b>NGO</b>	Non-Governmental Organization
<b>NPCU</b>	National Project Coordination Unit
<b>OH</b>	One Health
<b>PDO</b>	Project Development Objective
<b>PME</b>	Participatory Monitoring and Evaluation

<b>PTD</b>	Participatory Technology Development
<b>TIMPs</b>	Technology, Innovation and Management Practices
<b>ToTs</b>	Trainer of Trainers
<b>USDA</b>	United States Department of Agriculture
<b>VC</b>	Value Chain
<b>VCL</b>	Value Chain Lead
<b>WHO</b>	World Health Organization





## INTRODUCTION

### **About this manual**

This training of trainers' manual consist of two parts; part I and part II. Part I comprises notes for the facilitators while part II is made up of training modules in the value chain.

### **PART I**

This part consists of four sections including the Background of the chicken value chain, content of the training, training design and facilitators' guidelines.







## SECTION 1: BACKGROUND

### 1.1 The Role of Indigenous Chicken in the Kenyan Economy

The poultry industry in Kenya is dominated by chicken, with a population of 44.6 million birds. The indigenous chicken is the largest group with 36.6 million birds followed by exotic layers (4.2 million), broilers (3.1 million) and others (turkeys, ducks, geese) 0.7 million birds. Although indigenous chicken (IC) are the most abundant, their productivity is low. The IC produces 50% of the eggs and 60% of the poultry meat in Kenya. Over 80% of the households in Kenya keep IC which are generally owned by women and children who also control the benefits accrued. IC are therefore a good enterprise for increasing incomes for women, and the vulnerable and marginalized groups. A major proportion of these incomes for women goes to food items, directly addressing household food security.

### 1.2 Role of Indigenous Chicken in Food and Nutrition Security

Chicken production including that of indigenous chicken stands out as a viable option to address acute food insecurity due to its short production interval and adaptability for intensification in both rural and urban households. In Kenya, 30% of children under five are affected by stunting, which hinders their growth, development, and cognitive learning, and threatens their health. The underutilization of indigenous chicken and their products presents an opportunity to enhance nutrient intake and combat nutritional challenges in children and other vulnerable groups. Eggs, known for being an excellent source of easily absorbed protein crucial for tissue building and repair, are widely available and affordable. Chicken products have a high nutrient concentration that is rarely found in plant-based alternatives, contributing to improved nutrition for household members, especially children. Additionally, chicken meat not only offers a tasty and culturally familiar protein source for households involved in indigenous chicken (IC) rearing but also serves as a source of income. Promoting this activity can contribute to the reduction of childhood stunting and enhance the economic and social well-being of vulnerable populations in Kenya. The rearing of indigenous chicken and the consumption of their products plays a role in promoting a healthy population.

### 1.3 One Health Approach in Sustainability of the Indigenous Chicken Value Chain

The need to provide sustainable food solutions to combat food security challenges in Kenya has prompted intentional efforts to improve both livestock and crop production in recent times. However, engaging in livestock production, including chicken farming, comes with public health risks, such as zoonotic diseases and antimicrobial resistance in the commercialized chicken value chain. With over 75% of emerging diseases having a zoonotic origin, there is an urgent need to address the interactions between humans and animals. To effectively tackle these challenges, adopting a One Health strategy is essential, allowing for a comprehensive, multi-sectoral approach to prevent and mitigate the associated threats.

#### **1.4 Indigenous Chicken Value Chain as a Climate Smart Innovation**

Unlike ruminants, chicken are less affected by environmental variations caused by climate change. They are resilient and can survive extreme environmental fluctuations, such as drought, in which ruminants would not survive. Indigenous Chicken produce less (0.259 kg) greenhouse gases (GHG) compared to dairy cattle which generate 122.9 kg.

This manual approaches the Climate-Smart Agriculture (CSA) concept from the Indigenous Chicken perspective. The Kenya Climate Smart Agriculture Project (KCSAP) aims to validate and upscale Indigenous Chicken Technologies, Innovations and Management Practices (TIMPs) by: (1) improving efficiency in the use of resources to produce chicken for food; (2) maintaining the resilience of indigenous chicken systems and the dependent communities; and (3) gaining an understanding of how to reduce the vulnerability of communities negatively impacted by climate change in Kenya.

#### **1.5 Commercialisation Perspectives of Indigenous Chicken**

The poultry industry, encompassing indigenous chicken (IC) rearing, plays a significant role in Kenya's economy, constituting 30% of the gross domestic product (GDP) derived from agricultural contributions. Indigenous chicken are a compelling venture for smallholders, serving as the most prevalent livestock raised for both household consumption and sale. Moreover, this enterprise acts as a source of income also for individuals providing services required by indigenous chicken keepers for a fee. To realize increased incomes from this endeavour, it is crucial to adopt IC rearing practices that align with market needs. Providing agribusiness skills training especially to IC farmers will significantly contribute to the development of a commercially-oriented IC enterprise in the country. The focus is on ensuring that commercial products are fully integrated into the value chain, spanning from production to consumption. Emphasis should be placed on the comprehensive development and integration of commercial products and services, ensuring their inclusion in value chain promotion. This would be achieved through the commercialization of value chain activities, such as vaccinations, community disease-free zone management, delivery of IC products (including meat, eggs, and feathers), establishment of value addition centres, organized commercial IC product markets, and incubation and chick brooding. These activities present opportunities for realizing a commercially-oriented IC enterprise, ultimately leading to improved livelihoods.

#### **1.6 Objectives of the Training**

The purpose of this training is to provide farmer trainers with knowledge and skills on how to facilitate and support Farmer Field and Business Schools (FFBS) for increased productivity through adoption of Good Agriculture Practices (GAPs). Specifically, the objectives of this training are:



- a. To provide farmer trainers with knowledge and skills on indigenous chicken breeds, including establishment and management of innovative climate smart indigenous chicken rearing technologies.
- b. To provide farmer trainers with knowledge and skills in formulation and production of high quality low-cost indigenous chicken feeds for improved indigenous chicken production.
- c. To provide farmer trainers with knowledge and skills in indigenous chicken health management and biosecurity, for enhanced productivity and resilience to environmental stressors.
- d. To provide farmer trainers with relevant knowledge and skills in indigenous chicken post-harvest preservation techniques and value addition technologies for increased profitability through market linkages and distribution outlets.
- e. To provide farmer trainers with relevant knowledge and skills in indigenous chicken farming as a business and market assessment techniques through consumer driven market demand and supply trends.
- f. To provide farmer trainers with knowledge and skills in participatory techniques for empowerment of women, youth and vulnerable marginalized groups through development of inclusive stakeholder partnership programs

After the training, the Trainer of Trainers (ToTs) as facilitators will train lead farmers (LF) in various aspects of the indigenous chicken value chain. The training will involve providing the LF with techniques in participatory preparation, mobilization, planning, implementation, monitoring and evaluation of training sessions. The lead farmers and county extension personnel will thereafter upscale the adoption of GAPs through farmer groups in their villages and those in the neighbourhood.

## SECTION 2: TRAINING CONTENT

### 2.1 Orientation of the Module

This section of the training manual deals with the training content. It outlines the orientation and outline of the **19 modules**, which are orientated to ensure adoption and upscaling of indigenous chicken TIMPs, to improve productivity, resilience and mitigation of harmful greenhouse gases. The purpose of these modules is to enhance the knowledge and capacities of trainers in understanding and disseminating the climate-smart chicken practices to the intended beneficiaries, who are primarily farmers.

### 2.2 Module Outline

Each of the 19 modules consists of 8 parts. These parts are:

- a. **Introduction** – context and background to training needs, knowledge and skills gaps being addressed
- b. **Module learning outcomes** – what trainees are expected to learn
- c. **Module target group** – trainee categories
- d. **Module users** –facilitators
- e. **Module duration** –minimum number of hours of exposure to materials
- f. **Module summary** –sequence of sessions, training methods, materials and duration
- g. **Facilitators guideline** –detailed sessions, training methods, materials and session guides
- h. **Participant’s handouts** – detailed notes and reference materials for trainees,

The outline of the **19** modules is presented in **Table 1**.



**Table 1: Outline of summary modules for the indigenous chicken value chain**

No.	Module Name	Need Addressed	Expected raining Outcomes	Duration
1	The poultry industry in Kenya and its economic impact	<ul style="list-style-type: none"> <li>Understanding he poultry industry</li> </ul>	<ul style="list-style-type: none"> <li>The potential value of the industry as a key driver within the livestock sector recognized</li> <li>Demand for chicken products derived from existing consumption patterns projected</li> <li>Significance of chicken as a viable starting point for enhancing food and nutrition security at the household level understood</li> </ul>	1 hour
2	Climate Smart Agriculture practices in chicken production systems	<ul style="list-style-type: none"> <li>Demand for chicken and chicken products in current changing climatic scenario</li> </ul>	<ul style="list-style-type: none"> <li>Causes of climate change explained</li> <li>Principles of climate-smart agriculture described</li> <li>Climate change impacts along the chicken value chain and food security identified</li> <li>Indigenous chicken TIMPs and some basic approaches to their validation and dissemination defined</li> <li>climate smart agriculture practices in the indigenous chicken value chain described</li> <li>Climate smart agriculture practices along the indigenous chicken explained and appreciated</li> </ul>	2 hours

No.	Module Name	Need Addressed	Expected raining Outcomes	Duration
3	Farmer Field and Business School (FFBS) approach in indigenous chicken value chain	<ul style="list-style-type: none"> <li>Skills/ technologies for production, processing and marketing</li> </ul>	<ul style="list-style-type: none"> <li>Concept of Farmer Field and Business School approach in the Indigenous Chicken value chain, teaching and facilitating described and explained.</li> <li>Approaches on facilitating FFBS participatory learning process and developing FFBS curriculum for Indigenous Chicken value chain demonstrated and explained</li> <li>Knowledge and analytical skills to design simple experiments for testing and selecting the best option to mitigate the constraints of the Indigenous Chicken value chain mapped, identified and explained.</li> <li>Knowledge on engaging FFBS to shift from the subsistence production and focus on improving productivity towards farming business described and demonstrated</li> <li>Knowledge and skills in disseminating TIMPS through a well-defined action plan that is specific, measurable, achievable realistic and time bound (SMART) identified and explained in indigenous chicken value chain</li> </ul>	1 hour



No.	Module Name	Need Addressed	Expected raining Outcomes	Duration
4	Good Agricultural Practices (GAPs) and Food Safety Management Systems (FSMS) in indigenous chicken	<ul style="list-style-type: none"> <li>Enhance food safety through lowering presence of hazardous solids, organisms, pollutants and pathogens</li> </ul>	<ul style="list-style-type: none"> <li>Role of GAPs on matters of safety of IC and IC products explained</li> <li>Common hazards which compromise the safety of IC and IC products identified</li> <li>Role of veterinary services in supporting IC discussed</li> <li>Farm to fork concept in relation to food safety understood</li> <li>Recommended GAPs required for producing safe IC and IC products explained</li> <li>Food safety and quality described</li> <li>Critical control point (CCPs) at different levels of IC mapped and determined.</li> </ul>	3 hours
5	Breeding and selection of indigenous chicken	<ul style="list-style-type: none"> <li>Improvement and production of IC performing breeds</li> </ul>	<ul style="list-style-type: none"> <li>Importance of breeding and selection in IC farming explained</li> <li>Monitoring of poultry performance to aid in distinguishing best performers and avoid inbreeding explained.</li> <li>Productivity of IC different production systems recounted</li> </ul>	1 hour



No.	Module Name	Need Addressed	Expected raining Outcomes	Duration
			<ul style="list-style-type: none"> <li>• Traits for enhanced IC productivity identified The features to use in selection of cocks, growers and hens identified.</li> <li>• The selection methods for use in IC breeding described</li> <li>• Cock to hen ratio and fertility of eggs related matters described</li> <li>• Artificial insemination protocol in indigenous chicken described</li> </ul>	
6	Chicken Housing and Equipment	<ul style="list-style-type: none"> <li>• Appropriate IC housing</li> </ul>	<ul style="list-style-type: none"> <li>• Proficiency in preparing and planning for the construction of chicken structures tailored to diverse environments and production systems demonstrated.</li> <li>• Competence in constructing a well-designed and functional chicken house instilled</li> <li>• The essential equipment necessary for an efficiently equipped chicken house described</li> </ul>	1 hour

No.	Module Name	Need Addressed	Expected raining Outcomes	Duration
7	Chick Brooding	<ul style="list-style-type: none"> <li>Mortality of chicks from day old to four weeks</li> </ul>	<ul style="list-style-type: none"> <li>Preparation of chick brooder understood</li> <li>Accredited hatchery, quality chicks and proper means of transportation identified</li> <li>Feeding of chicks explained.</li> <li>Adequate management of brooding house micro-climate explained.</li> <li>Management of brooder hygiene articulated.</li> <li>Standard vaccination procedures described.</li> <li>Monitoring of chick performance demonstrated.</li> </ul>	1 hour
8	Production systems in indigenous chicken	<ul style="list-style-type: none"> <li>Inadequate knowledge on commercialized production systems</li> </ul>	<ul style="list-style-type: none"> <li>The main indigenous chicken production systems categorized</li> <li>The characteristics of the different production systems described</li> <li>The relevant criteria to consider in choosing a particular production system explained</li> <li>The linking of farmer objectives, expected outputs, and the choice of appropriate production system demonstrated</li> </ul>	1 hour



No.	Module Name	Need Addressed	Expected raining Outcomes	Duration
			<ul style="list-style-type: none"> <li>Assessment of suitable types and levels of resources required in choosing a particular system described</li> <li>The merits and demerits of each indigenous chicken production system identified</li> </ul>	
9	Feeds and feeding of indigenous chicken	<ul style="list-style-type: none"> <li>Reducing IC underfeeding and feed wastage thus reducing cost of production</li> <li>Poor quality feeds</li> <li>Reducing cost of commercial feeds</li> <li>Improve knowledge on alternative protein feed resources for feeding poultry(BSF)</li> </ul>	<ul style="list-style-type: none"> <li>Importance of feeding chicken explained</li> <li>Quantity to feed chicken described</li> <li>Formulation and compounding of chicken feeds demonstrated</li> <li>Equipment for compounding chicken feeds described</li> <li>Simple production and utilisation of termites, cockroaches, Moringa leaf meal, and black soldier fly (BSF) explained</li> <li>Management of common feedstuff problems identified</li> <li>The effective use of feeders and drinkers demonstrated</li> </ul>	4 hours

No.	Module Name	Need Addressed	Expected raining Outcomes	Duration
11	Indigenous Chicken Breeder Flock Management	<ul style="list-style-type: none"> <li>Improving egg production and fertility</li> <li>Improving hatchability of eggs</li> </ul>	<ul style="list-style-type: none"> <li>The feeding requirements of breeder flock birds explained.</li> <li>Cleaning and sanitizing feeding and watering equipment described.</li> <li>Maintaining suitable litter conditions in a poultry house described.</li> <li>The principles of managing chicken house microclimate for optimal bird health and performance explained.</li> <li>Describe effective strategies for managing the health of a breeder flock.</li> <li>Monitoring and recording of key performance indicators of a breeder flock explained.</li> <li>Proper handling and grading procedures for breeder flock eggs described.</li> <li>Accurate and up-to-date records of breeder flock performance and management practices described.</li> </ul>	1 hour



No.	Module Name	Need Addressed	Expected raining Outcomes	Duration
12	Indigenous Chicken Health Management	<ul style="list-style-type: none"> <li>• Mortality in chicken</li> </ul>	<ul style="list-style-type: none"> <li>• Management of indigenous chicken biosecurity understood and articulated.</li> <li>• Indigenous chicken health equipment and materials identified.</li> <li>• The Management of indigenous chicken vaccination procedures demonstrated</li> <li>• Control of indigenous chicken pests and parasites demonstrated.</li> <li>• Management of indigenous chicken vices understood.</li> <li>• Keeping and management of health records understood and demonstrated</li> </ul>	2 hours
13	One health approach for sustainable IC production	<ul style="list-style-type: none"> <li>• The approach mobilizes multiple sectors, disciplines and communities to improve human, animal and environmental health outcomes</li> </ul>	<ul style="list-style-type: none"> <li>• The one health concept understood</li> <li>• The components of OH triad identified.</li> <li>• The role of the different collaborators understood.</li> <li>• Appropriate OH practices for increased IC productivity and healthy ecosystem recommended</li> <li>• Zoonoses affecting IC understood</li> <li>• Anti-microbial resistance understood.</li> <li>• Waste management in relation to OH understood</li> </ul>	2 hours

No.	Module Name	Need Addressed	Expected raining Outcomes	Duration
	Waste management in indigenous chicken production	<ul style="list-style-type: none"> <li>Poor waste management and pollution</li> </ul>	<ul style="list-style-type: none"> <li>The importance of managing wastes from chicken production systems</li> <li>Management of chicken manure, feathers and dead birds in a circular economy demonstrated</li> <li>Management and application of chicken manure on crops demonstrated.</li> </ul>	1 hour
14	Vices in Chicken Production	<ul style="list-style-type: none"> <li>Improving skills and knowledge for detecting vices in chicken</li> </ul>	<ul style="list-style-type: none"> <li>Chicken vices identified and understood;</li> <li>Monitoring of good and bad behavior in chicken understood</li> <li>Best management practices in production understood</li> <li>Practical skills of managing stress/vices in chicken e.g. debeaking demonstrated</li> </ul>	1 hour
15	Nutritional value of chicken meat and eggs	<ul style="list-style-type: none"> <li>Enhanced nutrition in children and vulnerable groups</li> </ul>	<ul style="list-style-type: none"> <li>The nutritional content of chicken meat and eggs explained.</li> <li>The role of chicken meat and eggs in ensuring food and nutrition security explained.</li> <li>Nutritional importance and health benefits of chicken meat and eggs described.</li> </ul>	2 hours 30 minutes



No.	Module Name	Need Addressed	Expected raining Outcomes	Duration
			<ul style="list-style-type: none"> <li>• Contribution of chicken meat and eggs to dietary diversification and complementary feeding explained.</li> <li>• Nutrition-based value addition and product development applied to chicken meat and eggs described.</li> </ul>	
16	Value addition of chicken meat and egg products	<ul style="list-style-type: none"> <li>• Improve value addition and processing of IC products</li> <li>• Improve shelf life of chicken and chicken products</li> <li>• Meliorate price of unprocessed chicken and eggs.</li> </ul>	<ul style="list-style-type: none"> <li>• Chicken product (eggs and meat) handling and hygiene requirements outlined</li> <li>• Basic principles of chicken production processing and preservation recounted.</li> <li>• Benefits and factors to consider in chicken product value addition outlined</li> <li>• Chicken products value-addition methods and recipes demonstrated.</li> <li>• Quality and safety of value-added products explained.</li> <li>• Packaging and branding of chicken products demonstrated</li> </ul>	1 hours 30 minutes

No.	Module Name	Need Addressed	Expected raining Outcomes	Duration
17	Incubation and Hatchery Management	<ul style="list-style-type: none"> <li>• Improve hatchability of eggs</li> <li>• Meliorate performance of incubators and hatcheries</li> </ul>	<ul style="list-style-type: none"> <li>• Design and recommended biosecurity features of a hatchery understood.</li> <li>• Types of artificial incubators and their operational processes described.</li> <li>• Efficiency in breeder flock management techniques explained.</li> <li>• Hatching egg management, including collection, grading, handling, and storage conditions described.</li> <li>• Egg setting, fumigation, incubation, and candling processes understood.</li> <li>• Skills in egg transfer, chick harvesting, grading, vaccination, as well as packaging and transportation elaborated.</li> <li>• Protocols for hatchery cleaning and effective waste disposal/ management described.</li> <li>• Trouble shooting failures with egg incubation explained</li> </ul>	2 hours



No.	Module Name	Need Addressed	Expected raining Outcomes	Duration
18	Agribusiness and Marketing	<ul style="list-style-type: none"> <li>Enhancing knowledge in economics of IC production</li> <li>Lack of a coordinated market strategies in chicken and chicken products</li> </ul>	<ul style="list-style-type: none"> <li>How to undertake market assessment explained</li> <li>Facilitating farmers or their groups in developing a marketing plan explained</li> <li>Determining the types of chicken markets and the supply and demand patterns explained</li> <li>Differentiating between various marketing strategies, functions and the marketing plans well as understanding marketing tools in the chicken value chain explained</li> <li>Chicken and Chicken products marketing channels, marketing principles, value chain, distribution networks and the 8 P's of Marketing (product, price, place, promotion, people, positioning, processes, and performance) explained</li> </ul>	2 hours
19	Cross Cutting Themes in Chicken production			

No.	Module Name	Need Addressed	Expected raining Outcomes	Duration
19.1	Indigenous chicken Gender, Vulnerable And Marginalized Groups (VMGS), Socio, Environmental Concerns and Cohesion	<ul style="list-style-type: none"> <li>Gender inequalities include division of labour, access to and control of resources, and decision-making within and beyond the household</li> </ul>	<ul style="list-style-type: none"> <li>The concept of gender mainstreaming and social inclusion in indigenous chicken value chain appreciated.</li> <li>Youth empowerment in indigenous chicken value chain explained.</li> <li>Women empowerment in indigenous chicken value chain explained and understood.</li> <li>Strategies for inclusion of vulnerable and marginalized groups in indigenous chicken value chain understood and applied.</li> <li>Knowledge on environmental and social management framework (ESMF) tool explained and demonstrated.</li> </ul>	1 hour
19.2	Agricultural Innovation Platforms in the chicken value chain	<ul style="list-style-type: none"> <li>Lack of a forum for stakeholders in the chicken value chain to interact and develop technical, institutional and organizational innovations to solve value chain challenges</li> </ul>	<ul style="list-style-type: none"> <li>Innovation platforms defined and explained</li> <li>The characteristics of an AIP described and understood.</li> <li>Process of mobilization of stakeholders for initiation, establishment, management and sustenance of an AIP explained and demonstrated</li> </ul>	1 hour



No.	Module Name	Need Addressed	Expected raining Outcomes	Duration
			<ul style="list-style-type: none"> <li>• Business model development process of an AIP demonstrated</li> <li>• The innovation capacity building process of the AIP actors explained and understood</li> <li>• Benefits and challenges of AIP described</li> <li>• The sustainability of an AIP (exit strategy) explained and understood</li> </ul>	
19.3	Improved indigenous chicken policies and regulations	<ul style="list-style-type: none"> <li>• Lack of sufficient dispersion of information on chicken policies and regulations for smallholder farmers in Kenya.</li> </ul>	<ul style="list-style-type: none"> <li>• Key chicken policies and regulations explained, understood and applied</li> <li>• Compliance and record-keeping understood and applied</li> <li>• Quality and safety standards understood and applied</li> <li>• Environmental and sustainability regulations explained</li> <li>• Market Access and trade regulations understood and applied</li> <li>• Health and animal welfare regulations understood and applied</li> <li>• Consumer protection regulations understood and applied</li> <li>• Policy advocacy and engagement process understood</li> </ul>	1 hour
<b>TOTAL</b>				<b>32 hours 40 minutes</b>

## SECTION 3: TRAINING DESIGN

### 3.1 Delivery System

The delivery system designed for this training consists of two stages:

- a. **Establishment of a team of facilitators** - A Core Team of Trainers (CTT) to train farmer trainers (service providers) as facilitators of a ToT course will be established. This will be done using this manual and modules contained therein. Each of the master trainers will facilitate trainers of farmers and other stakeholders to acquire knowledge and skills for facilitating Farmer-led Field and Business Schools through practical demonstrations.
- b. **Upscaling** –This will be done by selecting Lead Farmers (LF) to be trained in facilitation skills.

### 3.2 Partners and their roles

The partners envisioned in this training plan are:

- a. **Core Team of Trainers** – Master trainers drawn from KALRO, universities, and tertiary institutions offering animal sciences and State Department of Agriculture, MoALD will facilitate initial training of trainers of farmers and other stakeholders. They will also provide mentorship to farmers’ trainers during the first year of LF trainings. They should also be available in the evaluation of the first round of LF trainings.
- b. **County Government Department for Livestock** – County Coordination Teams (CCT) including technical departments and service providers will play specific roles of LF trainers, mentors and coordinators at sub-county level. They will assist FFBS to form partnership with stakeholders for sustainability. They will also support LF to establish their upscaling networks.
- c. **Lead Farmer Networks** – Association of LFs in the counties to take up farmer trainings and upscaling in the future. Lead farmer networks and groups will conduct exchange visits to learn best practices in other project implementing counties.
- d. **Private Sector Service Providers** – Inputs suppliers, financial and business development service providers, market players, and processors will partner to support growth of individual or chicken farmer groups.
- e. **Agripreneurs** – Business people whose investments in parts of chicken value chain is important in spurring social change and conduct of business therein.

### 3.3 Training duration

The proposed ToT course for Master Trainers for 19 modules in the Indigenous chicken value chain shall take a total of 32 hours 40 minutes of training period. This does not include break hours of mid-morning, afternoon and lunch breaks

### 3.4 Logic of Design and Flow of Session

The logic of design and flow of each module is that the facilitator, while paying attention to the proposed methods and session guidelines, shall: (i) Introduce



the module; (ii) Draw out the participant's expectations; (iii) Relate participants' expectations with module objectives or learning outcomes; (iv) Explore the concept and content, switching to different methods of delivery of the content (group exercise, brainstorming, excursions, plenary discussions, role plays) as the session progresses; (v) Review the module at the end using participatory approaches, such as having one participant read one summary message and its application; and, (vi) Distribute the participants' handouts.

## SECTION 4: FACILITATOR'S GUIDELINES

### 4.1 Preparation of Training Materials

The suggested training materials require adequate preparation and should be available before the actual training dates. Furthermore:

- a. The facilitators should familiarize themselves with and internalize the guidelines provided in this manual before the training.
- b. Stationery required, including name tags, writing materials, paper punch, and medium-sized box files for participants' handouts filing, should be available within the training institution 3 days before the training.
- c. Flip charts and good quality felt pens can be used interchangeably with projections. Each participant will require one felt pen, while the trainers will need two sets of felt pens.
- d. Visual aids, such as field equipment and tools, should also be arranged in time before the sessions start.
- e. Adequate copies of participants' handouts (one per participant) should be distributed at the end of each session or as deemed suitable.
- f. Copies of the modules are distributed at the end of each module.

### 4.2 Preparation of Training Venue and Sites

The training venue will include the training room, field demonstration and market sites.

- a. **Training Room** – Should have adequate space for 25 participants seated in a semi-circle or U-shaped arrangement, ensuring access and unobstructed view of the front. Additionally, there should be adequate space for a desk and seats for three trainers, preferably at the sides or at the back of the training room. A desk for the trainers, along with their training materials, projector, a flip chart holder and a white wall acting as a projector screen is also necessary.
- b. **Demonstration Site** – Should be within a walking distance with at least five distinct plots for demonstrations.
- c. **Market Sites** – these include cereal retail outlets (kiosks, stalls, shops and supermarkets), whole sale and aggregation points and processing sites if any. The operators should be informed in advance about the visits. These should not be very far away preferably less than 10 minutes' drive distance.

### 4.3 The Trainees

The trainees who will participate are extension officers, lead farmers, educators, service providers and researchers with elaborate training background in extension and advisory services. They will be drawn from public and private sectors based on considerable experience in training farmers, but with minimal facilitative advisory or technology transfer approaches. The facilitator should act more as a facilitator than a lecturer and needs to draw out and build upon the knowledge, skills and experience that the trainees bring to the program. As a golden rule, the facilitator should not



lecture the trainees but facilitate, listen and let them feel like equals to each other and the CTT team members.

#### 4.4 Training Program

The proposed training program consists of the actual training modules. Health breaks should be considered when drawing the training program. The training program should preferably be based on the outline presented in **Annex 1** to allow flow of ideas and topics. However, should the situation demand, the sequence and day of coverage for whole or parts of the modules can be modified to suit emerging requirements.

#### 4.5 Training Methods

The training methods proposed for each session are suitable for adult learners and appropriate for addressing knowledge, skills and attitudes of the participants. The choice of the methods has been informed by the competency issues being addressed, time available and experiences of the author of this manual. Depending on time available, the facilitator may modify these training methods but as a golden rule, no presentation by the facilitator should take more than 30 minutes continuously; but should be separated by the other participatory training methods. Table 2 presents a list of available training methods

**Table 2: Description of Training methods**

Training Method	Description of Method
Plenary presentations	Use of PowerPoint or flip charts and plenary discussions in situations where knowledge and opinion or consensus is required
Group exercises, visits and brainstorming sessions	To be considered where skills are an issue requiring sharing and trying
Plenary discussions -	Plenary discussions have been considered as training methods where attitude is an issue
On-farm practical demonstration and exchange visits	To be considered where hands-on practical skills are acquired through sharing and demonstration
Role play	Involves acting, performing or dramatising the part of a person or character used to foster teamwork and cohesion within teams

#### 4.6 Planning Schedule and Guideline for ToT Preparation

While planning for this training, the CTT leader should ensure the following before the training:

1. **Six weeks** – Recruit master trainers, compose CTT, have at least one chicken farm near training venue where possible
2. **Four weeks** – Send out invitation letters to participants and special guests detailing purpose, venue and program. Also follow up on demonstration sites and brief CTT members
3. **Two weeks** – Confirm names of participants; reproduce training materials for facilitators and package them, confirm preparedness of the field sites to be visited, and hold briefing of CTT members to finalize training plan. Additionally, confirm attendance of any special guests.
4. **Four days** – Confirm training sites preparedness, prepare sitting arrangements, and brief assistants
5. **One day** – Arrange training room furniture, and place materials, equipment and stationery on the tables. Arrange for reception of trainees at the proposed residence.
6. **On first day** – Arrange for reception of trainees at the training venue. Ensure climate setting is done before the course is officially opened. This includes:
  - Registration
  - Welcoming to venue by host
  - Elaborate introduction of CTT and participants
  - Introduction to the project and training course
  - Ground rules
  - Groups formation

#### 4.7 Evaluation of the Training

Half-day has been allocated for planning for way forward and evaluation of the ToT on the last day of the training, as presented in the program in section 4.4. The evaluation strategy should take two directions: first, individual trainee's evaluation through evaluation forms without conferring or refereeing to each other. Next, the evaluation forms are collected and analysed by the CTT members.

The second evaluation approach is trainees' group evaluation. They retreat to one room and elect a chair and a secretary. Ask them to objectively and constructively evaluate the training in about 45 minutes in the absence of the CTT members. They then present their evaluation to the CTT members and as they do so, the CTT members should only give points of clarifications if any misunderstanding occurred but should not try to be defensive. The CTT members then use the two evaluation results to write a report, highlighting aspects that went on well and can be replicated, challenges encountered, and opportunities for future improvements in ToT sessions.



**Table 3: Sample Evaluation Form**

<b>Aspect / Module</b>	<b>Very Useful (3 marks)</b>	<b>Useful (2 marks)</b>	<b>Of Limited Use (1 marks)</b>
1. The poultry industry in Kenya and its economic impact			
2. Climate Smart Agriculture Practices in Chicken Production Systems			
3. Farmer Field and Business School (FFBS) approach in indigenous chicken value chain			
4. Good Agricultural Practices (GAPs) and Food Safety Management Systems (FSMS) in indigenous chicken)			
5. Breeding and selection of indigenous chicken			
6. Chicken Housing and equipment			
7. Chick Brooding			
8. Production systems in indigenous chicken			
9. Feeds and feeding of indigenous chicken			
10. Indigenous chicken breeder flock management			
11. Indigenous Chicken Health Management			
12. One health approach for sustainable IC production			
13. Vices in Chicken Production			
14. Waste management in indigenous chicken production			
15. Nutritional value of chicken meat and eggs			
16. Value addition of chicken meat and egg products			
17. Incubation and Hatchery Management			
18. Agribusiness and Marketing of chicken and Chicken products			

19. Cross Cutting Themes in Chicken production			
19.1 Indigenous chicken Gender, Vulnerable And Marginalized Groups (VMGS), Socio, Environmental Concerns and Cohesion			
19.2 Agricultural Innovation Platforms in the chicken value chain			
19.3 Improved indigenous chicken policies and regulations			

## 4.8 Facilitator's Training Notes and Reference Materials

### 4.8.1 Key references

Two key references should be provided for each module plus a list of other relevant publications for reference.

### 4.8.2 Guide on the use of the information

The trainers will be advised to issue farmers with utmost two publications for each training session. This is because going away with 10 publications in one visit might overwhelm farmers with information, potentially limiting their knowledge uptake. Additionally, there is a risk that some farmers may take as many publications as they can if there are no restrictions. The complete list of individual publications will be stored and made available as electronic copies, mainly in PDF format. Service providers are strongly advised to keep these electronic copies on a memory stick, or portable hard drive, allowing farmers easy access and if necessary, the ability to print them at a local internet café.

Trainers will be advised to issue one general chicken farming manual, accompanied by two other publications such as information sheets, brochures, factsheets or posters. As subsequent training modules are conducted, trainees can gradually build their collection of publications.









## **PART II: TRAINING MODULES**





## **MODULE 1: THE INDIGENOUS CHICKEN INDUSTRY IN KENYA AND ITS ECONOMIC IMPACT**

### **1.1 Introduction to the Module**

This module provides an overview of the current status of the indigenous chicken industry in Kenya, highlighting its potential to generate employment, income, and contribute to food and nutrition security. The contribution of the industry economy will also be highlighted in relation to other livestock sub-sectors and the overall agricultural sector. The industry is assured of sustained growth because of the increased demand, driven by urbanisation, population growth, economic expansion, and the current viability of chicken production systems. Projections indicate a need for a more than 50 percent increase in chicken production by 2030 to meet this rising demand. Consequently, there is a critical need to enhance and modernise the chicken value chain to improve productivity, profitability, and resilience.

### **1.2 Module Learning Outcomes**

By the end of the training module, the following outcomes should be achieved:

1. The status of the chicken industry in Kenya explained.
2. The potential value of the industry as a key driver within the livestock sector described and explained.
3. Projected demand for chicken products derived from existing consumption patterns described

4. The significance of indigenous chicken as a viable value chain for enhancing food and nutrition security at the household level described and explained

### 1.3 Module Target Group

This module targets agriprenuers, service providers, public and private extension agents, co-operatives, and potential investors.

### 1.4 Module Users

This module is intended for use by master trainers who are members of the Core Team of Trainers (CTT). The module user should thoroughly familiarize themselves with the participant's Participants' handouts and training reference materials.

### 1.5 Module Duration

The Module is estimated to take **1 hour**.

### 1.6 Module Summary

Chicken Industry in Kenya and its contribution to the economy			
Sessions	Training methods	Training Materials	Time
1.6.1 Introduction and objectives expectations	<ul style="list-style-type: none"> <li>Personal introductions</li> <li>Plenary Presentation</li> </ul>	<ul style="list-style-type: none"> <li>Flip charts</li> <li>Felt pens</li> <li>Projector</li> <li>Laptop</li> </ul>	5 minutes
1.6.2 National and county chicken population	<ul style="list-style-type: none"> <li>Plenary presentation</li> <li>Plenary Discussions</li> </ul>	<ul style="list-style-type: none"> <li>Participants' handouts</li> <li>Flip charts</li> <li>Felt pens</li> <li>Projector</li> <li>Laptop</li> </ul>	10 minutes
1.6.3 Contribution of chicken to the economy	<ul style="list-style-type: none"> <li>Plenary Presentation</li> <li>Plenary Discussions</li> </ul>	<ul style="list-style-type: none"> <li>Flip charts</li> <li>Felt pens</li> <li>Projector</li> <li>Participants' handouts</li> <li>Laptop</li> </ul>	15 minutes
1.6.4 Projected demand for chicken products in local and the region at large	<ul style="list-style-type: none"> <li>Plenary Presentation</li> <li>Plenary Discussions</li> </ul>	<ul style="list-style-type: none"> <li>Flip charts</li> <li>Felt pens</li> <li>Projector</li> <li>Participants' handouts</li> </ul>	15 minutes
1.6.5 Global perspectives of the chicken industry	<ul style="list-style-type: none"> <li>Plenary presentation</li> <li>Plenary Discussions</li> </ul>	<ul style="list-style-type: none"> <li>Flip charts</li> <li>Felt pens</li> <li>Projector</li> <li>Laptop</li> <li>Participants' handouts</li> </ul>	15 minutes
<b>TOTAL</b>			<b>1 hour</b>



## 1.7 Facilitator's Guidelines

Chicken industry in Kenya and its contribution to GDP	
1.7.1 Introduction, objectives and expectations (5 minutes)	Session Guide
<p><b>Introduction (5 minutes)</b>  <i>The facilitator introduces the module and invites trainees' to introduce themselves and state their expectations.</i></p> <p><b>Module objectives</b>  <i>(The facilitator presents module objectives)</i>            By the end of the training module, the trainee should be able to:</p> <ol style="list-style-type: none"> <li>1. Explain status of the chicken industry in Kenya</li> <li>2. Describe and explain the potential value of the industry as a key driver within the livestock sector described and explained.</li> <li>3. Describe the projected demand for chicken products derived from existing consumption patterns</li> <li>4. Describe and explain the significance of indigenous chicken as a viable value chain for enhancing food and nutrition security at the household level</li> </ol>	<ul style="list-style-type: none"> <li>• Summarise participants "expectations" using cards/flip charts</li> <li>• PowerPoint presentation to introduce the module</li> <li>• Participants' handouts</li> </ul>
1.7.2 National and county chicken population (10 minutes)	Session Guide
<p><b>Plenary presentation (5 minutes)</b></p> <ul style="list-style-type: none"> <li>• Overview of national and county chicken populations</li> </ul> <p><i>The facilitator will provide a comprehensive overview of both the national and county chicken populations. This presentation will be supported by up-to-date and relevant infographics and charts.</i></p> <p><b>Plenary discussion (5 minutes)</b></p> <ul style="list-style-type: none"> <li>• Specific county chicken development agenda and roadmap.</li> </ul> <p><i>The interactive session will allow trainees to share details, insights, and collaboratively explore strategies for the development of chicken in their respective counties.</i></p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Infographs on national and local chicken population</li> <li>• Participants' handouts</li> <li>• Q&amp;A sessions</li> </ul>

1.7.3 Contribution of chicken to the economy (15 minutes)	Session Guide
<p><b>Plenary presentation (5 minutes)</b></p> <ul style="list-style-type: none"> <li>Contribution of chicken to both the livestock and agricultural economy.</li> </ul> <p><i>During the presentation, emphasis will be placed on unveiling the economic potential inherent in the chicken industry.</i></p> <p><b>Plenary discussion (10 minutes)</b></p> <p><i>This discussion aims to shed light on the often-overlooked aspects of the industry that can significantly impact and enhance economic outcomes within the broader agricultural sector.</i></p>	<ul style="list-style-type: none"> <li>PowerPoint presentation</li> <li>Participants' handouts</li> <li>Q &amp; A session</li> <li>Plenary discussion</li> </ul>
1.7.4 Projected demand for chicken products (15 minutes)	Session Guide
<p><b>Plenary presentation and discussion</b></p> <ul style="list-style-type: none"> <li>Factors that contributes to increased demand for chicken products</li> </ul> <p><i>The facilitator guides trainees and discusses factors that contributes to increased demand for chicken products.</i></p>	<ul style="list-style-type: none"> <li>PowerPoint presentation</li> <li>Participants' handouts</li> <li>Q&amp;A session</li> <li>Plenary discussion</li> </ul>
1.7.5 Global outlook in chicken production (15 minutes)	Session Guide
<p><b>Plenary presentation</b></p> <ul style="list-style-type: none"> <li>Advances in global chicken production systems</li> </ul> <p><i>The presentation covers chicken production systems that include breeds, efficiency in feed utilization and current animal welfare issues affecting the industry.</i></p>	<ul style="list-style-type: none"> <li>PowerPoint presentation</li> <li>Participants' handouts</li> <li>Q&amp;A session</li> </ul>

## 1.8 Reference materials

### 1.8.1 Participants' handouts

- Training notes on chicken industry in Kenya and its contribution to GDP

### 1.8.2 References

- KARI (2006) Indigenous chicken production manual. KARI Technical Note No. 18, February 2006
- Alaru, P, Mwaura, M., Wasike, C., Ngeno, K., Ouko, O, K'Oloo, T., Mwangi, S., Kamidi, C. Miyumo, S. and Ilatsia, E. (2021). KALRO Chicken management manual.



3. FAO (2019). The future of livestock in Kenya: opportunities and challenges in the face of uncertainty. Nairobi, Kenya
4. 2021/22 State Department of Livestock – Livestock population data



## MODULE 2: CLIMATE SMART AGRICULTURE PRACTICES IN CHICKEN PRODUCTION SYSTEMS

### 2.1 Introduction to the Module

Climate change is a barrier to global sustainable development, with different regions experiencing positive and negative effects on agricultural and livestock systems. Developing countries, particularly those in Sub-Saharan Africa, such as Kenya, have experienced more severe negative consequences. The escalation of temperatures, coupled with an increase in the incidence of extreme weather phenomena like El Niño and La Niña, aggravates these adverse impacts. Their consequences include decreased agricultural output, land degradation, and crop, animal, and fish losses as a result of shifting climatic patterns.

The country's agriculture sector is predominantly rain-fed and therefore vulnerable to climate change. The sector is not only impacted upon by climate change but also contributes to the problem through human activity. In Kenya, livestock-related activities are estimated to contribute to 92 percent of the total GHG emissions from agriculture, mainly via enteric fermentation (20.8 Mt CO<sub>2</sub>eq or 55 percent) and manure left on pasture (13.6 Mt CO<sub>2</sub>eq or 36.9 percent) (WRI CAIT 2.0, 2017). This is envisaged to increase to 27 Mt CO<sub>2</sub>e by 2030.

Apart from the threat of climatic changes, the livestock sector is affected by increasing population pressures and demand for natural resources. In their quest to boost incomes, enhance food security, increasing overall productivity and market competitiveness, agricultural households face the challenge of maintaining an efficient natural resource base. Kenyan poultry contribute significantly to family income generation, helping not just the general population but also women and youth. Thriving in diverse



environments, indigenous chicken demonstrate efficiency in converting feed into high-quality food, with a smaller environmental footprint compared to the ruminant livestock. Despite concerns about their susceptibility to shifting weather patterns, the use of appropriate breeds can enhance their adaptability to a changing climate. This module highlights the need for climate-smart agricultural practices, which can sustainably increase productivity, support resilience and adaptation to changing climatic conditions, mitigate or remove greenhouse gases, and contribute to the attainment of national food security and development goals.

## 2.2 Module Learning Outcomes

By the end of the module, the following outcomes should be achieved:

1. Climate change and its causes explained
2. The principles of climate-smart agriculture described
3. Climate change impacts along the chicken value chain and food security identified and explained
4. Practical solutions that chicken producers can put into practice to deal with climate change effects described

## 2.3 Module Target Groups

This module is intended for use by public and private extension agents, agri-preneurs and lead farmers.

## 2.4 Module Users

This module is intended for use by trainers who are members of the Core Team of Trainers (CTT) and Farmer Trainers. The module user should thoroughly familiarize themselves with the participant's Participants' handouts and training reference materials.

## 2.5 Module duration

The Module is estimated to take **2 hours**

## 2.6 Module Summary

Climate Smart Agriculture Practices			
Sessions	Training methods	Training materials	Time
2.6.1 Module Introduction, outcomes and expectations	<ul style="list-style-type: none"> <li>• Personal introductions</li> <li>• Plenary presentation</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Felt pens</li> <li>• Projector</li> <li>• Laptop</li> <li>• PowerPoint presentation</li> <li>• Participants' handouts</li> </ul>	15 minutes

2.6.2 Understanding climate change	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Felt pens</li> <li>• Projector</li> <li>• Laptop</li> <li>• Participants' handouts</li> </ul>	30 minutes
2.6.3 The effects of climate change on the poultry industry and food security	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Group work</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Felt pens</li> <li>• Projector</li> <li>• Laptop</li> <li>• Participants' handouts</li> </ul>	30 minutes
2.6.4 Climate smart agriculture and indigenous chicken value chain -specific practices	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Group work</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Felt pens</li> <li>• Projector</li> <li>• Laptop</li> <li>• Participants' handouts</li> </ul>	30 minutes
2.6.5. Module review	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Projector</li> <li>• Laptop</li> <li>• Participants' handouts</li> </ul>	15 minutes
<b>TOTAL</b>			<b>2 hours</b>

## 2.7 Facilitator's Guidelines

Climate Smart Chicken Management Practices	
2.7.1 Introduction, outcomes and expectations (15 minutes)	Session Guide
<p><b>Introduction</b>  <i>The facilitator introduces the module and invites trainees to introduce themselves and state their expectations. The facilitator presents module objectives and expectations.</i></p> <p><b>Module objectives</b>  <i>(The facilitator presents module objectives)</i>            By the end of the training module, the trainee must be able to:</p> <ul style="list-style-type: none"> <li>• Explain climate change and its causes</li> <li>• Describe the principles of climate-smart agriculture</li> <li>• Identify and explain climate change impacts along the chicken value chain and food security</li> <li>• Describe practical solutions that chicken producers can put into practice to deal with climate change effects</li> </ul>	<ul style="list-style-type: none"> <li>• Summarise participants "expectations" using cards/flip charts.</li> <li>• PowerPoint presentation</li> <li>• Participants' handouts</li> </ul>



<b>2.7.2 Understanding climate change (30 minutes)</b>	<b>Session guide</b>
<b>Plenary presentation (15 minutes)</b> Climate change causes, effects, and mitigation  <b>Plenary discussion (15 minutes)</b> <ul style="list-style-type: none"> <li>The participants recall what they learnt and discuss any issues that may arise.</li> <li>Questions are answered during this session.</li> </ul>	<ul style="list-style-type: none"> <li>PowerPoint presentation</li> <li>Plenary discussion</li> </ul>
<b>2.7.3 Climate change impacts on livestock systems and food security (30 minutes)</b>	<b>Session guide</b>
<i>The facilitator makes a presentation on the effects of climate change on livestock systems and food security and guides the participants in discussing the impact of climate change on food security</i>  <b>Plenary presentation (15 minutes)</b> <ul style="list-style-type: none"> <li>Effects of climate change on livestock</li> <li>Contribution of agriculture to climate change</li> <li>The link between climate change and food security</li> </ul> <b>Plenary discussion (15 minutes)</b> <ul style="list-style-type: none"> <li>Question and answer session.</li> <li>Sharing of experiences and practical discussions on climate change in livestock systems and food security</li> </ul>	<ul style="list-style-type: none"> <li>PowerPoint presentation</li> <li>Plenary discussion</li> </ul>
<b>2.7.4 Climate Smart Agriculture TIMPs definitions and context-specific practices (30 minutes)</b>	<b>Session guide</b>
<b>Plenary presentation (10 minutes)</b> <ul style="list-style-type: none"> <li>Definitions of TIMPs and their validation through adaptive research and their dissemination</li> <li>Characteristics of CSA and why CSA?</li> <li>Principles of climate-smart agriculture (Triple wins)</li> </ul> <b>Plenary discussion (10 minutes)</b> <ul style="list-style-type: none"> <li>CSA practices that ameliorate climate change effects on the chicken value chain</li> </ul> <b>Group Work (10 minutes)</b> Participants to conceptualize and provide examples of CSA TIMPs and climate smart indigenous chicken practices	<ul style="list-style-type: none"> <li>PowerPoint presentation</li> <li>Group work</li> <li>Plenary discussions</li> </ul>

2.7.5 Module review (15 minutes)	Session guide
<p><i>The facilitator leads the participants in reviewing and discussing the module</i></p> <ul style="list-style-type: none"> <li>• Summarize and review the main points of the module with the trainees.</li> <li>• Identify new concepts in the module</li> <li>• Problems and issues addressed</li> <li>• Highlight the take-home messages</li> </ul>	<ul style="list-style-type: none"> <li>• Recap of the key take-home points using any of the following participatory methods:</li> <li>• Q &amp; A session</li> <li>• Plenary discussions</li> <li>• Questionnaires</li> </ul>

## 2.8 Reference materials

### 2.8.1 Participants' handouts

- Training notes on climate smart agriculture practices in chicken production systems

### 2.8.2 References

1. World Bank; CIAT. (2015) Climate-Smart Agriculture in Kenya. CSA Country Profiles for Africa, Asia, and Latin America and the Caribbean Series. Washington D.C.: The World Bank Group.
2. FAO (2019). Climate Smart Agriculture Curriculum/Module for Training of Trainers in Myanmar. (Angon 28 pp). Food and Agricultural Organization of the United Nations and AVSI Foundation, Naypyidaw, Myanmar.
3. FAO (2018). Climate Smart Agriculture Training Manual: A reference manual for agricultural extension agents. Food and Agricultural Organization of the United Nations, Rome (106 pp).
4. GIZ-SLM (2017). Climate Smart Agriculture: A Manual for Implementing the Sustainable Land Management Programme (SLMP). Ethiopia and GIZ, Addis Ababa,
5. Denmark (2017). Climate Smart Agriculture Manual for Agricultural Education in Zimbabwe, Climate Technology Centre and Network, Denmark, 2017
6. FAO (2013). Climate Smart Agriculture Sourcebook. Food and Agricultural Organization of the United Nations, Rome, Italy.





## **MODULE 3: FARMER FIELD AND BUSINESS SCHOOL (FFBS) APPROACH IN INDIGENOUS CHICKEN VALUE CHAIN**

### **3.1 Introduction to the module**

Farmer Field and Business School (FFBS) is an extension method that promotes exploration, discovery and adaptation of agribusiness and production under local conditions. The “right way” means not only building on suitable science and technological methods, but also fitting into local ecological, social, economic and historical contexts. Finding the “right way” means that, all stakeholders need to participate and gain ownership of the process. The vision inherent in Farmer Field and Business Schools is that trainers work alongside farmers as advisors and facilitators, encouraging independence, analysis and organization.

This module is designed for training on the Farmer Field and Business Schools (FFBS) approach and concepts, which involve transfer of various technologies, innovations and management Practices (TIMPs) in Indigenous Chicken value chain to farmers. The trainees will thereafter facilitate farmers in the Common Interest Groups (CIGs) to learn by doing from a common plot of FFBS and then implement what they have learnt on their individual farms in order to meet the NAVCDP project objective

of Indigenous Chicken value chain commercialisation. Since the methodology is participatory, it improves the learners' observation skills and creates linkages with other value-chain players, thereby making Indigenous Chicken production profitable and sustainable.

### **3.2 Module Learning Outcomes**

By the end of the module, the following outcomes should be achieved:

1. Concept of Farmer Field and Business School approach in indigenous chicken value chain, teaching and facilitating described and explained.
2. Approaches on facilitating FFBS participatory learning process and developing FFBS curriculum demonstrated and explained in Indigenous Chicken value chain
3. Knowledge and analytical skills to design simple experiments for testing and selecting the best option to mitigate the constraints of indigenous chicken value chain mapped identified and explained.
4. Knowledge on engaging FFBS to shift from the subsistence production and focus on improving productivity towards farming business described and demonstrated
5. Knowledge and skills on disseminating TIMPs through a well-defined action plan that is specific, measurable, achievable realistic and time bound (SMART) identified and explained in indigenous chicken value chain

### **3.3 Module Target Group**

This module targets agricultural extension service providers and agri-prenuers based at sub-county and ward level. It will also be useful for private extension service providers dealing directly with farmer groups at community level and lead farmers

### **3.4 Module Users**

This module is intended for use by Master Trainers who are members of the Core Team of Trainers (CTT), Lead Farmers and agri-prenuers in the Indigenous Chicken value chain target counties. The trainers using this module should thoroughly familiarize themselves with the participants' handouts (training materials).

### **3.5 Module Duration**

The Module is estimated to take a minimum of 1 hour



### 3.6 Module Summary

Module 3 5 Farmer Field and Business School Approach			
Sessions	Training Methods	Training Materials	Time
3.5.1 Introduction, Climate setting, levelling of expectations and objectives.	<ul style="list-style-type: none"> <li>Discussions</li> <li>Setting norms and group</li> </ul>	<ul style="list-style-type: none"> <li>Laptop</li> <li>Projector</li> <li>PowerPoint presentation</li> <li>Flip charts</li> <li>Mark pens</li> <li>Participants' handouts</li> </ul>	5 minutes
3.5.2 Overview of FFBS key activities	<ul style="list-style-type: none"> <li>Plenary Presentations</li> <li>Plenary discussions</li> </ul>	<ul style="list-style-type: none"> <li>Pictorials</li> <li>PowerPoint presentation</li> <li>Projector</li> <li>Laptop</li> <li>Participants' handouts</li> </ul>	5 minutes
3.5.3 Introduction to Communication and communication skills	<ul style="list-style-type: none"> <li>Plenary presentation</li> <li>Group discussions</li> </ul>	<ul style="list-style-type: none"> <li>Laptop</li> <li>PowerPoint presentation</li> <li>Projector</li> <li>Flip charts</li> <li>Felt pens</li> <li>Participants' handouts</li> </ul>	10 minutes
3.5.4 Facilitation and leadership skills	<ul style="list-style-type: none"> <li>Plenary presentation</li> <li>Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>Laptop</li> <li>PowerPoint presentation</li> <li>Projector</li> <li>Participants' handouts</li> </ul>	10 minutes
3.5.5 Organization and management in FFBS	<ul style="list-style-type: none"> <li>Plenary Presentation</li> </ul>	<ul style="list-style-type: none"> <li>Laptop</li> <li>PowerPoint presentation</li> <li>Projector</li> <li>Participants' handouts</li> </ul>	10 minutes
3.5.6 Developing FFBS Curriculum for the Indigenous Chicken value chain	<ul style="list-style-type: none"> <li>Group discussion</li> <li>Plenary presentation</li> </ul>	<ul style="list-style-type: none"> <li>Laptop</li> <li>PowerPoint presentation</li> <li>Projector</li> <li>Flip charts</li> <li>Felt pens</li> <li>Participants' handouts</li> </ul>	15 minutes
3.5.9 Module review	<ul style="list-style-type: none"> <li>Discussions</li> <li>Plenary presentation</li> <li>Conclusion and way forward</li> </ul>	<ul style="list-style-type: none"> <li>Flip charts</li> <li>PowerPoint presentation</li> <li>Laptop</li> <li>Projector</li> </ul>	5 minutes
<b>TOTAL</b>			<b>1 hour</b>

### 3.7 Facilitator's Guidelines

3.7.1 Introduction, climate setting levelling expectations and objectives (5 minutes)	Session Guide
<p><i>(Introduction of trainees, setting training norms, formation of FFBS sub-groups (Working groups) and trainees to share their expectations)</i></p> <p><b>Modules objectives</b></p> <p>The facilitator presents modules objectives</p> <p>By the end of the module, the trainee should be able to:</p> <ul style="list-style-type: none"> <li>• Describe and explain the concept, characteristics, principles and plans of Farmer Field and Business School (FFBS) as a 'learning by doing approach as it applies in Indigenous Chicken value chain</li> <li>• Demonstrate and explain approaches to effective facilitation and participatory learning for FFBS.</li> <li>• Identify and demonstrate knowledge and analytical skills to design simple experiments for testing options.</li> <li>• Describe and explain the shift from the traditional focus on subsistence farming to improving productivity for enhanced farming business</li> <li>• Identify and explain a well-defined action plan for TIMPs dissemination that is specific, measurable, achievable realistic and time bound (SMART)</li> </ul>	<ul style="list-style-type: none"> <li>• Provide checklist for introduction of trainees to help them build confidence in participation</li> <li>• Summarize and display trainees expectations</li> <li>• Assign roles to the Sub groups</li> <li>• Set norms and nominate leaders</li> <li>• PowerPoint presentation on the Objectives of the FFBS training module</li> </ul>
3.7.2 Overview of FFBS key activities (5 minutes)	Session guide
<p><b>Plenary presentation</b></p> <p><i>The facilitator takes the trainees through the main concepts and pillars of FFBS which includes:</i></p> <ul style="list-style-type: none"> <li>• Concept, characteristics, principles of Farmer</li> <li>• Field and Business School (FFBS)</li> <li>• Participatory Technology Development (PTD) for the Indigenous chicken value chain TIMPs</li> <li>• Livestock Ecosystems Analysis (LESA) of the Indigenous Chicken value chain</li> <li>• FFBS principle of Integrated production and pest management (IPPM)</li> <li>• FFBS Business concept and opportunities in the Indigenous Chicken value chain stages</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> </ul>



3.7.3 Introduction to Communication and Communication skills (10 minutes)	Session guide
<p><b>Group exercise</b>  <i>Gauge the understanding of trainees on:</i></p> <ul style="list-style-type: none"> <li>• Communication channels</li> <li>• Barriers to effective communication</li> <li>• How to effectively communicate</li> </ul> <p><b>Plenary presentation</b></p> <ul style="list-style-type: none"> <li>• Communication and communication skills</li> </ul>	<ul style="list-style-type: none"> <li>• Group exercise</li> <li>• Participants' handouts</li> <li>• PowerPoint presentation</li> </ul>
3.7.4 Facilitation and leadership skills (10 minutes)	Session guide
<p><b>Plenary presentation</b></p> <ul style="list-style-type: none"> <li>• Definitions of facilitation and facilitator</li> <li>• Effective facilitation and qualities of a good facilitator.</li> <li>• Golden rules of facilitation.</li> <li>• Roles and responsibilities of FFBS Facilitators.</li> <li>• Difference between facilitation and teaching</li> <li>• Definition and elements of leadership</li> <li>• Types of leadership and characteristics of a good leader</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> </ul>
3.7.5 Organization and management in FFBS (10 minutes)	Session guide
<p><b>Plenary presentation on FFBS implementation and framework (10 minutes)</b></p> <ul style="list-style-type: none"> <li>• Ground working</li> <li>• Training of Facilitators</li> <li>• Establishing PTDs at the FFBS</li> <li>• Season long FFBS sessions</li> <li>• Evaluation of PTDs</li> <li>• Field days</li> <li>• Graduation</li> <li>• Establishment of Lead FFBS</li> <li>• Follow ups.</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Participants' handouts</li> </ul>

3.7.6 Developing FFBS Curriculum for the Indigenous Chicken value chain (15 minutes)	Session guide
<p><b>Plenary presentation</b>  <i>Steps of Participatory technology development on the indigenous chicken value chain production</i></p> <ul style="list-style-type: none"> <li>Identify the major constraints to increased yields of Meat and eggs in Indigenous Chicken value chain production</li> <li>Ranking of constraints in order from highest.</li> <li>Identify list of TIMPs to address the constraints</li> <li>Rank the TIMPs in order from the most preferred</li> <li>Develop PTD on the most preferred</li> <li>Decide on the parameters for LESA</li> <li>Develop FFBS curriculum using Chicken developmental stages</li> <li>calendar for the Indigenous Chicken value chain</li> </ul> <p><b>Group exercises</b></p> <ul style="list-style-type: none"> <li>Pair wise matrix ranking of constraints and TIMPs in Indigenous Chicken value chain</li> <li>Curriculum development based on the Indigenous Chicken value chain developmental stages</li> <li>Presentations of the group exercises on flip charts</li> </ul> <p><b>Plenary presentation on curriculum development</b></p> <ul style="list-style-type: none"> <li>Constraint identification and ranking</li> <li>TIMPs options identification and ranking</li> <li>Identification of the growth stages of the indigenous Chicken value chain</li> <li>Development of Indigenous Chicken FFBS training curriculum</li> </ul>	<ul style="list-style-type: none"> <li>PowerPoint presentation</li> <li>Group exercises</li> </ul>
3.7.7 Module review ( 5 minutes)	Session guide
<p><i>(The facilitator leads the trainees in reviewing the module)</i></p> <p><b>Plenary Presentation and Discussion</b></p> <ul style="list-style-type: none"> <li>Questions and answers</li> <li>Facilitator's Summary</li> </ul>	<ul style="list-style-type: none"> <li>PowerPoint presentation</li> <li>Plenary discussion</li> </ul>

## 3.8 Reference materials

### 3.8.1 Participants' handouts

- FFBS factsheets
- FFBS training notes



### 3.8.2 References

1. Ferris, S., Kaganzi, E., Best, R., Ostertag, C., Lundy, M. and Wandschneider, T (2008) A Market Facilitation Guide to Participatory Agroenterprise Development International Centre for Tropical Agriculture (CIAT), Cali, Colombia.
2. FAO (2006) Farmer Field school guidance document planning for quality programmes.



## **MODULE 4: GOOD AGRICULTURAL PRACTICES (GAPS) AND FOOD SAFETY MANAGEMENT SYSTEMS (FSMS) IN INDIGENOUS CHICKEN (IC)**

### **4.1 Introduction to the module**

Good Agricultural Practices (GAPs) for indigenous chicken production are meant to help competent authorities support stakeholders, including farmers to fully assume their responsibilities at the animal production stage of the food chain to help produce safe food. Food safety is universally recognised as a public health priority. It requires a holistic approach, from production to consumption. GAPs for indigenous chicken complement the responsibilities of competent authorities at the farm level, in particular those of veterinary services and are intended to assist in developing quality assurance systems for IC products food safety.

GAPs for IC are aimed at addressing animal health and welfare, socioeconomics and environmental issues related to farming practices. Many aspects of indigenous chicken production are at a risk from biological, chemical (including radionuclide) and physical agents. These hazards may enter indigenous chicken products through a variety of exposure points along the value chain with consequent potential risks to consumers. Among the recommended GAPs to address the hazards in indigenous chicken products include; General farm management, animal health management, veterinary medicine and biologicals, animal feeding and watering, environment and infrastructure and animal and product handling. This module is designed for training and exposing trainees to food safety management systems along the IC value chain.



## 4.2 Module Learning Outcomes

By the end of the module, the following outcomes should be achieved.

1. The role of GAPs on matters of IC value chain safety and quality described.
2. Common hazards which compromise the safety of IC products identified.
3. The role of veterinary services in supporting farmers to produce safe IC products explained.
4. The farm to fork concept in relation to food safety explained
5. The recommended GAPs required for producing safe IC products described.
6. Traceability in IC products safety and quality mapped and described.
7. Critical Control Points (CCPs) at different levels of production of IC and IC products mapped and determined.

## 4.3 Module Target Group

This module targets livestock extension service providers and agri-prenuers based at the sub- county and ward levels. It will also be used by private livestock extension service providers dealing directly with farmer groups at the community level and lead farmers.

## 4.4 Module Users

This module is intended for use by master trainers who are members of the core team trainers (CTT), lead farmers and agri-prenuers in the IC value chain in target counties. The facilitators using this module should thoroughly familiarize themselves with the participants' handouts.

## 4.5 Module Duration

The module is estimated to take a minimum of 3 hours

## 4.6 Module Summary

Module 4: Good Agricultural Practices (GAPs) and Food Safety Management Systems (FSMS)			
Sessions	Training Methods	Training Materials	Time
4.6.1 Introduction, objectives and levelling of expectations	<ul style="list-style-type: none"><li>• Groups exercise</li><li>• Plenary Presentation</li></ul>	<ul style="list-style-type: none"><li>• Marker pens</li><li>• Flip chats</li><li>• PowerPoint Presentation</li><li>• Laptop</li><li>• Projector</li><li>• Participants' handouts</li></ul>	15 minutes

4.6.2 General indigenous chicken farm management	<ul style="list-style-type: none"> <li>• Group work</li> <li>• Plenary Presentations</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Marker pens</li> <li>• Flip charts</li> <li>• PowerPoint Presentation</li> <li>• Laptop</li> <li>• Projector</li> <li>• Participants' handouts</li> </ul>	20 minutes
4.6.3 Indigenous Chicken health management	<ul style="list-style-type: none"> <li>• Group work</li> <li>• Plenary presentation</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• PowerPoint presentation</li> <li>• Laptop</li> <li>• Projector</li> <li>• Pictorials</li> <li>• Data sheets</li> <li>• Participants' handouts</li> </ul>	20 minutes
4.6.4 Veterinary medicine and biologicals	<ul style="list-style-type: none"> <li>• Group work</li> <li>• Plenary Presentations</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• PowerPoint presentation</li> <li>• Laptop</li> <li>• Projector</li> <li>• Pictorials</li> <li>• Data sheets</li> </ul>	20 minutes
4.6.5 Indigenous chicken environment and infrastructure	<ul style="list-style-type: none"> <li>• Group work</li> <li>• Plenary presentation</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Pictorials</li> <li>• Knapsacks</li> <li>• Measuring cylinders</li> <li>• Tape measure</li> <li>• Nozzles</li> <li>• Empty clean Pesticide containers</li> <li>• Participants' handouts</li> </ul>	20 minutes
4.6.6 Indigenous chicken and product handling.	<ul style="list-style-type: none"> <li>• Group work</li> <li>• Plenary presentation</li> <li>• Plenary discussions</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• PowerPoint presentation</li> <li>• Laptop</li> <li>• Projector</li> <li>• Participants' handouts</li> </ul>	20 minutes
4.6.7 Hazards and corresponding control points in IC value chain	<ul style="list-style-type: none"> <li>• Group work</li> <li>• Plenary presentation</li> <li>• Plenary discussions</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• PowerPoint presentation</li> <li>• Laptop</li> <li>• Projector</li> <li>• Participants' handouts</li> </ul>	40 minutes



4.6.8 Module review	<ul style="list-style-type: none"> <li>• Participants' questions and comments</li> <li>• Facilitator's</li> <li>• Summary</li> </ul>	<ul style="list-style-type: none"> <li>• Participants' handouts</li> <li>• Module review</li> <li>• Flip charts</li> <li>• Laptop</li> <li>• Projector</li> </ul>	25 minutes
<b>TOTAL</b>			<b>3 hours</b>

## 4.7 Facilitator's Guidelines

<b>Module 4: Good Agricultural Practices (GAPs) and Food Safety Management Systems (FSMS)</b>	
<b>4.7.1 Introduction and Levelling Expectations (15 minutes)</b>	<b>Session Guide</b>
<p><i>The facilitator welcomes trainees to the module on FSMS and introduces him/herself stating profile and experience of working with farmers.</i></p> <p><b>Trainees' introductions and expectations (5 minutes)</b>  <i>The facilitator invites the trainees to introduce themselves and state their expectations</i></p> <p><i>The facilitator presents module objectives</i></p> <p><b>Module objectives (10 minutes)</b>  By the end of the module, the trainee should be able to:</p> <ul style="list-style-type: none"> <li>• Describe the role of GAPs on matters of IC safety and quality described.</li> <li>• Identify Common hazards which compromise the safety of IC products.</li> <li>• Explain the role of veterinary services in supporting IC farmers to produce safe food.</li> <li>• Explain the farm to fork concept in relation to food safety.</li> <li>• Describe the recommended GAPs required for producing safe IC.</li> <li>• Describe traceability in IC products safety and quality</li> <li>• Determine Critical control points (CCPs) at different levels of production of IC and IC products.</li> </ul>	<ul style="list-style-type: none"> <li>• Summarise and display trainees' expectations on a flipchart</li> <li>• PowerPoint presentation</li> </ul>

4.7.2 General indigenous chicken farm management (20 minutes)	Session Guide
<p><i>The facilitator leads discussions on understanding of general farm management as a GAPs and the relevance to IC</i></p> <p><b>Group work (5 minutes)</b>  <i>The trainees list some of the general farm management practices.</i></p> <p><b>Plenary presentation (10 minutes)</b></p> <ul style="list-style-type: none"> <li>• General farm management as a GAP in the context of IC production</li> <li>• Legal obligations relevant to livestock production e.g. disease reporting, record keeping, animal identification and carcass disposal.</li> </ul> <p><b>Plenary discussion (5 minutes)</b>  <i>In plenary, ask the trainees to give their experiences in general farm management and address any issues that may arise.</i></p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Participants' handouts</li> </ul>
4.7.3 Indigenous chicken health management (20 minutes)	Session Guide
<p><i>(The facilitator guides discussions on animal health management as a GAP).</i></p> <p><b>Group work (5 minutes)</b>  <i>Trainees list some of the animal health management practices in the farms.</i></p> <p><b>Plenary presentation (10 minutes)</b></p> <ul style="list-style-type: none"> <li>• Animal health management as a GAP in the context of IC production.</li> <li>• Topics to be covered include; biohazards and physical hazards</li> </ul> <p><b>Plenary discussion (5 minutes)</b>  <i>In plenary, ask the trainees to give their experiences in Animal health management and address any issues that may arise</i></p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Participants' handouts</li> </ul>



<p><b>4.7.4 Veterinary medicine and biologicals (20 minutes)</b></p> <p><i>(The facilitator leads the trainees in summarising the key points in handling veterinary medicine and biologicals)</i></p> <p><b>Group work (5 minutes)</b>  <i>Trainees to list some of the veterinary medicine and biologicals they have interacted with in their farms.</i></p> <p><b>Plenary Presentation (10 minutes)</b></p> <ul style="list-style-type: none"> <li>• Veterinary medicines and biologicals as a GAP in the context of IC production.</li> <li>• Restrictions on medicines or biologicals used in IC, using veterinary medicines and biologicals as per manufacturer’s instruction or prescription</li> <li>• Use of antimicrobials in accordance with regulatory requirements and public health/veterinary guidance.</li> </ul> <p><b>Plenary Discussion (5 minutes)</b>  <i>In plenary, ask the trainees to give their experiences in handling veterinary medicines and biologicals and address any issues that may arise</i></p>	<p><b>Session Guide</b></p> <ul style="list-style-type: none"> <li>• Group work</li> <li>• PowerPoint presentation</li> <li>• Participants’ handouts</li> </ul>
<p><b>4.7.5 Indigenous chicken feeding and watering (20 minutes)</b></p> <p><i>(The facilitator leads the trainees in summarizing the key points in animal feeding and watering)</i></p> <p><b>Group work (10 minutes)</b>  <i>Trainees to list some of the animal feeding and watering issues they have interacted with in their farms.</i></p> <p><b>Plenary presentation (5 minutes)</b></p> <ul style="list-style-type: none"> <li>• Animal feeding and watering issues as a GAP in the context of IC production. Key topics to be addressed include; hygiene, managing the feed chain, water quality and nutrition</li> </ul> <p><b>Plenary discussion (5 minutes)</b>  <i>In plenary, ask the trainees to give their experiences in handling animal feeding and watering issues and address any issues that may arise</i></p>	<p><b>Session guide</b></p> <ul style="list-style-type: none"> <li>• Group work</li> <li>• PowerPoint presentation</li> <li>• Participants’ handouts</li> </ul>

4.7.6 Indigenous chicken Environment and infrastructure (20 minutes)	Session Guide
<p><i>(Facilitator guides discussions on environment and infrastructure as a GAP).</i></p> <p><b>Group work (5 minutes)</b> Trainees to list some of the environment and infrastructure practices that affect food safety.</p> <p><b>Plenary presentation (10 minutes)</b> PowerPoint presentation to environment and infrastructure as a GAP in the context of IC production. Key topics to be addressed;</p> <ul style="list-style-type: none"> <li>• Welfare; Ensure ICs are confined and their welfare addressed in terms of ventilation, drainage and manure removal.</li> <li>• Location; Location of farms away from industrial and other pollution and sources of contamination or infection.</li> <li>• </li> </ul> <p><b>Plenary discussion (5 minutes)</b> In plenary, ask the participants to give their experiences in handling environment and infrastructure issues and address any issues that may arise</p>	<ul style="list-style-type: none"> <li>• Group work and presentation by groups</li> <li>• PowerPoint presentation</li> <li>• Participants' handouts</li> </ul>
4.7.7 Indigenous and product handling (20 minutes)	Session Guide
<p><i>Facilitator guides the trainees on animal and product handling.</i></p> <p><b>Group work (5 minutes)</b> Trainees to list some of the environment and infrastructure practices that affect food safety.</p> <p><b>Plenary presentation (10 minutes)</b> Animal and product handling as a GAP in the context of IC production. Key topics to be addressed include; slaughter animal handling, feeding, hygiene, storage conditions and record keeping</p> <p><b>Plenary discussion (5 minutes)</b> In plenary, ask the participants to give their experiences in animal and product handling and address any issues that may arise</p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Global GAP checklists</li> <li>• Participants' handouts</li> </ul>



4.7.8 Hazards and corresponding control points IC value chain (40 minutes)	Session Guide
<p><i>The facilitator guides the trainees on hazards and control points.</i></p> <p><b>Group work on biohazards (8 minutes)</b>  <i>Trainees to list some of the common biohazards.</i></p> <p><b>Plenary presentation and discussion on biohazards (5 minutes)</b></p> <ul style="list-style-type: none"> <li>• Introduction to pathogens and contaminants</li> <li>• Pathogen and contaminant transmission</li> <li>• Airborne, Feed and waterborne infections and contaminants</li> <li>• Anti-microbial and parasiticide resistance</li> </ul> <p><b>Group work on chemical hazards (8 minutes)</b>  <i>Trainees to list some of the common chemical hazards.</i></p> <p><b>Plenary presentation on chemical hazards (5 minutes)</b></p> <ul style="list-style-type: none"> <li>• Chemical contamination of feed, water and environment</li> <li>• Residues of veterinary medicines and biologicals</li> </ul> <p><b>Group work on physical hazards (8 minutes)</b>  <i>Trainees to list some of the physical hazards.</i></p> <p><b>Plenary presentation and discussion on physical hazards (6 minutes)</b></p> <ul style="list-style-type: none"> <li>• Sharps waste disposal</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Participants' handouts</li> <li>• Group discussion</li> <li>• Plenary discussion</li> </ul>
4.7.9 Module review (25 minutes)	Session Guide
<p><i>The facilitator leads the trainees in summarising the key points discussed in the module.</i></p> <p><b>Plenary discussion</b>  <i>Discuss with trainees about new lessons learnt from this module and Some of the problems and issues that they have become more aware of in the module</i></p>	<ul style="list-style-type: none"> <li>• Plenary discussion</li> <li>• Plenary presentation</li> </ul>
<b>TOTAL</b>	<b>6 hours 10 minutes</b>

## **4.8 Reference materials**

### **4.8.1 Participants' handouts**

- Good Agricultural Practices (GAP) training notes
- Good Agricultural Practices (GAP) pamphlets and leaflets

### **4.8.2 References**

1. FAO and OIE (2009) Guide to good farming practices for animal production food safety. Food and Agriculture Organization of the United Nations, Rome, Italy
1. FAO/WHO (2023) CODEX Alimentarius commission procedural manual. 28th Edition. Joint FAO/WHO food standards program





## MODULE 5: BREEDING AND SELECTION OF INDIGENOUS CHICKEN

### 5.1 Introduction to the Module

Many farmers begin raising indigenous chicken with just a few birds. To turn this into a thriving commercial enterprise, they need a plan for increasing flock size. This requires knowledge of different poultry breeds, their strengths and weaknesses, and their potential for crossbreeding. Knowledge and skills on breeding and selection are critical for a profitable indigenous chicken enterprise. Breeding and selection is also crucial to maintaining a vibrant, high-performance flock that also provides a good pool of birds to select from while avoiding inbreeding.

Selection involves separating the well-performing growers and productive hens, and the well-sized, active cocks, from the flock. A set criteria illustrating the features to assess is used to distinguish the best performers from the rest of the birds for the hens, cocks, and growers. Selection is further facilitated by the presence of performance records kept on the farm. This module demonstrates the process and approach in breeding and selection of indigenous chicken.

### 5.2 Learning Outcomes

By the end of the module, the following outcomes should be achieved.

1. The importance of breeding and selection in IC farming explained
2. Monitoring of poultry performance to aid in distinguishing best performers and avoid inbreeding explained.
3. Productivity of IC different production systems recounted.
4. Traits to be improved for enhanced IC productivity identified.

5. The features to use in selection of cocks, growers and hens described.
6. The selection methods for use in IC breeding described
7. Cock to hen ratio and fertility of eggs explained.
8. Artificial insemination protocol in indigenous chicken explained.

### 5.3 Target Group and Categories

This module targets agricultural extension, extension service providers based at the county level and lead farmers.

### 5.4 Module Users

This module is intended for use by trainer of trainers (TOT) in poultry production value chain master trainers who are members of the Core Team of Trainers (CTT). This module outlines the learning outcomes, the category of trainees targeted, module summary, and participants' handouts. The facilitator using this module should thoroughly familiarize themselves with the participant's handouts.

### 5.5 Module Duration

The module is estimated to take a minimum of **1 hour**.

### 5.6 Module Summary

Breeding and Selection			
Sessions	Training Methods	Training Materials	Time
5.6.1 Introduction, module outcomes and expectations	<ul style="list-style-type: none"> <li>Plenary presentation</li> <li>Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>Flip charts</li> <li>Felt pens</li> <li>Laptop</li> <li>Projector</li> </ul>	5 minutes
5.6.2 Importance of breeding and selection in IC farming	<ul style="list-style-type: none"> <li>Discussion</li> <li>Plenary presentation</li> </ul>	<ul style="list-style-type: none"> <li>Projector</li> <li>Laptop</li> <li>Flip charts,</li> <li>Felt pens</li> </ul>	5 minutes
5.6.3 Monitoring of poultry performance and keeping of records to aid in distinguishing best performers and avoid inbreeding	<ul style="list-style-type: none"> <li>Plenary presentation</li> <li>Plenary discussion</li> <li>Practical demonstrations</li> </ul>	<ul style="list-style-type: none"> <li>Projector</li> <li>Flip charts</li> <li>Felt pens</li> <li>Participants' handouts</li> </ul>	5 minutes
5.6.4 Breeds and categories of birds to select from	<ul style="list-style-type: none"> <li>Plenary discussions</li> <li>Practical demonstration</li> <li>Plenary presentation</li> </ul>	<ul style="list-style-type: none"> <li>Projector</li> <li>Laptop</li> <li>Flip chart</li> <li>Practical notes</li> <li>Participants' handouts</li> </ul>	5 minutes



5.6.5 Features to use in selection of cocks, growers and hens	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Plenary discussions</li> <li>• Demonstration practice</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• laptop</li> <li>• Flip chart</li> <li>• Photographs</li> </ul>	5 minutes
5.6.6 IC production systems	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Plenary discussions</li> <li>• Practical demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Flip chart</li> <li>• Participant' handouts</li> <li>• Photographs</li> </ul>	10 minutes
5.6.7 Traits to be improved for enhanced IC productivity	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Plenary discussions</li> <li>• Demonstration</li> <li>• Practical session</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Flip chart</li> <li>• Participants handouts,</li> <li>• Photographs, practical notes</li> </ul>	10 minutes
5.6.7 Selection methods for use in IC breeding	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Group discussions</li> <li>• Practical demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Flip chart</li> <li>• Participants handouts</li> </ul>	5 minutes
5.6.8 Cock to hen ratio and fertility of eggs	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Group discussions,</li> <li>• Practical demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Flip chart</li> <li>• Participants handouts, photographs</li> </ul>	5 minutes
5.6.9 Module Review	<ul style="list-style-type: none"> <li>• Plenary discussion</li> <li>• Facilitator's summary</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluation forms</li> </ul>	5 minutes
<b>TOTAL</b>			<b>1 hour</b>

## 5.7 Facilitator's Guidelines

Breeding and Selection	
5.7.1 Introduction, outcomes and expectations (5 minutes)	Session Guide
<p><i>The facilitator welcomes trainees to the module on indigenous chicken breeding and selection, introduces the module and invites them to give their expectations. The facilitator then outlines the module objectives.</i></p> <p><b>Module objectives</b></p> <p>By the end of the module the trainee should be able to:</p> <ul style="list-style-type: none"> <li>• Explain the importance of breeding and selection in IC farming.</li> <li>• Explain monitoring of poultry performance to aid in distinguishing best performers and avoid inbreeding.</li> <li>• Recount productivity of IC different production systems.</li> <li>• Identify traits to be improved for enhanced IC productivity.</li> <li>• The features to use in selection of cocks, growers and hens</li> <li>• Describe the selection methods for use in IC breeding described</li> <li>• Explain the cock to hen ratio and fertility of eggs.</li> <li>• Explain artificial insemination protocol in indigenous chicken.</li> </ul>	<ul style="list-style-type: none"> <li>• Summarize participants “expectations” by listing them on a flip chart</li> <li>• PowerPoint presentation</li> <li>• Share training materials at the end of the module</li> </ul>
5.7.2 Importance of breeding and selection in IC farming (10 minutes)	Session guide
<p><b>Plenary discussion</b></p> <p>The participants discuss the importance of breeding and selection.</p> <p><i>The facilitator gives a power point presentation on Importance of breeding and selection</i></p> <p>Any issue or questions arising is answered during this session.</p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussion</li> </ul>



<b>5.7.3 Traits to be improved for enhanced IC productivity (10 minutes)</b>	<b>Session guide</b>
<p><i>The facilitator makes a power point presentation on traits considered for improvement in IC and reasons for improvement</i></p> <p><b>Group discussion</b></p> <ul style="list-style-type: none"> <li>• Participants are divided into groups in and tasked to list various traits of economic importance that farmers in their respective jurisdictions prioritize</li> <li>• The groups present their work and any issue or questions arising is answered during this session</li> </ul> <p><b>Plenary discussion</b></p> <p>Any issue or questions arising is answered during this session.</p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussion</li> <li>• Group Discussions</li> </ul>
<b>5.7.4 Differentiate productivity of IC different production systems (5 minutes)</b>	<b>Session guide</b>
<p><i>The facilitator makes a presentation on genetic productivity of IC under different production systems</i></p> <p><b>Plenary discussion</b></p> <p>The participants recall what they learnt and discuss any issues that may arise. Any questions are also answered during this session.</p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussion</li> </ul>
<b>5.7.5 Demonstrate the features to use in selection of cocks, growers and hens (5 minutes)</b>	<b>Session guide</b>
<p><b>Various methods of selecting specific classes of IC</b></p> <p><i>The facilitator gives a PowerPoint presentation highlighting the following;</i></p> <ul style="list-style-type: none"> <li>• Different classes of IC (Chick, Growers, Hen and Cocks)</li> <li>• Key features and characteristics that are considered for different classes when doing selection</li> <li>• Applicability of different selection methods for classes of IC</li> </ul> <p><b>Practical Session/ Group work</b></p> <ul style="list-style-type: none"> <li>• Selection of chicks, cocks, growers and hens</li> </ul> <p><b>Plenary discussion</b></p> <p>Any issue or questions arising is answered during this session.</p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Group work</li> <li>• Plenary discussions</li> </ul>

<b>5.7.6 Selection methods for use in IC breeding (5 minutes)</b>	
<p><i>The facilitator makes a presentation on different methods of IC.</i></p> <p><b>Plenary discussion</b> The participants discuss any issues that may arise. Any questions are also answered during this session.</p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussions</li> </ul>
<b>5.7.7 Cock to hen ratio and fertility of eggs (5 minutes)</b>	<b>Session guide</b>
<p><i>The facilitator makes a presentation on cock to hen ratio</i></p> <p><b>Plenary discussion</b></p> <ul style="list-style-type: none"> <li>• Participants discuss various factors that affect fertility of eggs and their remedies.</li> <li>• The groups present their work and any issue or questions arising is answered during this session</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussions</li> </ul>
<b>5.7.8 Module review (20 minutes)</b>	<b>Session guide</b>
<p><i>The facilitator leads the participants in reviewing the module</i></p> <p>Summarize and review the main points of the training on breeding and selection</p>	<ul style="list-style-type: none"> <li>• Q &amp; A session</li> <li>• Discussions</li> <li>• Questionnaires</li> </ul>

## 5.8 Reference materials

### 5.8.1 Participants' handouts

- KALRO IC Breed brochure
- Training notes on indigenous chicken breeding and selection

### 5.8.2 References

1. KARI (2012) Indigenous chicken Training manual. [https://www.kalro.org/csapp/images/SPADE-CLEP-manual\\_July-23-small1.pdf](https://www.kalro.org/csapp/images/SPADE-CLEP-manual_July-23-small1.pdf)
2. Alaru, P A.O., Wangui, G., Ouko, V.O. & Miano, D (2016) Indigenous Chicken Selection and Breeding





## MODULE 6: CHICKEN HOUSING AND EQUIPMENT

### 6.1 Introduction to the module

Appropriate chicken housing plays a crucial role in ensuring the efficient production and management of birds, making a significant contribution to disease control. A well-designed chicken house serves as a protective barrier against predators, thieves, and adverse weather conditions such as rain, sun, cold winds, and low night temperatures. It also provides a suitable environment for meat chicken, egg laying and broody hens. The choice of chicken houses and shelters varies based on factors like the availability of construction materials, prevailing weather conditions, and local traditions. When determining the type of housing, considerations should include production system, cost, durability, and the intended usage.

Overall, housing stands out as the most expensive fixed asset. The cost of building and maintaining appropriate chicken housing has a substantial impact on chicken farming budgets. This expense is justified, however, as proper housing is vital for ensuring the well-being of the birds, contributing to efficient production, and the overall success of the chicken enterprises.

This module is intended for training and providing trainees with the requisite knowledge on the construction and equipping of chicken houses. It emphasises the utilisation of locally available construction materials and discusses the factors influencing the selection of the appropriate type of housing to be constructed.

### 6.2 Learning Outcomes

By the end of this module, the following outcomes should be achieved.

1. Selection of suitable sites for chicken houses described.
2. The cost implications of chicken houses in production explained

3. The various designs of chicken houses based on production system identified and described.
4. The importance of proper housing of chicken explained
5. The use of locally available materials in construction of chicken houses described.
6. The different accessories necessary in a chicken house identified and explained

### 6.3 Module Target Group

This module targets agricultural extension private and public service providers and agri-preneurs.

### 6.4 Module Users

This module is intended for use by master trainers who are members of the Core Team of Trainers (CTT).

### 6.5 Module Duration

The Module is estimated to take 1 hours.

### 6.6 Module Summary

Construction of Indigenous Chicken Structures			
Breeding and Selection	Breeding and Selection	Training Materials	Time
6.6.1 Introduction, objectives and expectations	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Laptop</li> <li>• Flip charts</li> <li>• felt pens</li> </ul>	10 minutes
6.6.2 Preparation and planning for construction of Chicken structures	<ul style="list-style-type: none"> <li>• Group discussion</li> <li>• Plenary presentation</li> <li>• Plenary discussion</li> <li>• Demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Laptop</li> <li>• Flip charts</li> <li>• Participants' handouts</li> <li>• Felt pens</li> <li>• Materials for demonstration (measuring tapes, sisal twines, wooden pegs, and squares)</li> </ul>	15 minutes



6.6.3 Construction of indigenous chicken structures and accessories	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Group discussion</li> <li>• Plenary discussion</li> <li>• Demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Laptop</li> <li>• Flip charts</li> <li>• Felt pens</li> </ul>	15 minutes
6.6.4. Equipping indigenous chicken houses	<ul style="list-style-type: none"> <li>• Group discussions</li> <li>• Plenary presentations</li> <li>• Group work</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Laptop</li> <li>• Flip charts</li> <li>• Felt pens</li> <li>• Demonstration materials</li> <li>• Exercise guide</li> </ul>	15 minuets
6.6.5 Module review	<ul style="list-style-type: none"> <li>• Participants' questions and comments</li> <li>• Facilitator's summary</li> </ul>	<ul style="list-style-type: none"> <li>• Participants' handouts</li> <li>• Module review</li> <li>• Flip charts</li> <li>• Laptop</li> <li>• Projector</li> </ul>	5 minutes
<b>TOTAL</b>			<b>1 hours</b>

## 6.7 Facilitators Guidelines

Construction of indigenous chicken Structures	
6.7.1 Introduction, outcomes and expectations (10 minutes)	Session Guide
<p><i>The facilitator introduces the module and invites trainees to introduce themselves and state their expectations.</i></p> <p><b>Module objectives</b>  The facilitator presents module objectives  By the end of this module, trainees should be able to:</p> <ul style="list-style-type: none"> <li>• Describe how to select suitable sites for chicken houses.</li> <li>• Explain the cost implications of chicken houses in production</li> <li>• Identify and describe the various designs of chicken houses based on production system.</li> <li>• Explain the importance of proper housing of chicken.</li> <li>• Describe the use of locally available materials in construction of chicken houses.</li> <li>• Identify and explain different accessories necessary in a chicken house.</li> </ul>	<ul style="list-style-type: none"> <li>• Summarise trainees' expectations using cards or any appropriate method.</li> <li>• PowerPoint presentation</li> <li>• Participants' handouts</li> </ul>

<b>6.7.2 Preparation and planning for construction of Indigenous Chicken structures (15 minutes)</b>	<b>Session guide</b>
<p><i>The facilitator makes a presentation on preparation and planning for construction of Chicken structures</i></p> <p><b>Plenary presentation (10 minutes)</b></p> <ul style="list-style-type: none"> <li>• Construction of Chicken structures</li> <li>• IC house layout</li> <li>• Construction of biosecurity structures</li> <li>• Factors to consider in installation of accessory structures.</li> <li>• Site clearing</li> </ul> <p><b>Plenary discussion (5 minutes)</b></p> <p><i>Participants review the topic, reflecting on their acquired knowledge, and engage in discussions to address any emerging issues. Additionally, any questions raised during this session are addressed.</i></p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussion</li> <li>• Plenary presentation</li> <li>• Demonstration</li> </ul>
<b>6.7.3 Construction of Chicken structures and accessories (10 minutes)</b>	<b>Session guide</b>
<p><i>The facilitator conducts presentation on the construction of chicken structures and accessories.</i></p> <p><b>Plenary Presentation (5 minutes)</b></p> <ul style="list-style-type: none"> <li>• Factors to consider in installation of accessory structures.</li> <li>• Construction of accessory structures for chicken using locally available materials</li> <li>• Conventional accessories</li> <li>• Home-made accessories</li> <li>• Correct installation of accessories</li> </ul> <p><b>Plenary discussion (5 minutes)</b></p> <p><i>The trainees pose questions related to the presentation, receiving responses from the facilitator. Additionally, they engage in discussions sharing practical experiences regarding the construction of chicken structures and accessories.</i></p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussion</li> <li>• Demonstration</li> <li>• Participants' handouts</li> </ul>
<b>6.7.4 Equipping Indigenous chicken houses (15 minutes)</b>	<b>Session guide</b>
<p><b>Plenary presentation (10 minutes)</b></p> <p><i>The facilitator makes a presentation highlighting:</i></p> <ul style="list-style-type: none"> <li>• Equipment and material necessary in a chicken house</li> <li>• Factors determining the choice of equipment.</li> <li>• Installation of equipment and materials</li> <li>• Testing-running of the equipment</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Group work</li> <li>• Plenary discussions</li> <li>• Participants' handouts</li> </ul>



<p><b>Group work and plenary presentations (5 minutes)</b></p> <p><i>Trainees are tasked with conceptualizing and creating a comprehensive list of equipment for a chicken house, which will be presented during the plenary session.</i></p>	
<p><b>6.7.5 Module review (5 minutes)</b></p>	<p><b>Session guide</b></p>
<p><b><i>The facilitator leads the trainees in reviewing the module.</i></b></p> <ul style="list-style-type: none"> <li>Summarize and review the key points of the training module with the trainees, focusing on climate-smart agriculture practices.</li> <li>Reflect on newly acquired knowledge from this module.</li> <li>Discuss emerging problems and issues that have gained awareness during the module.</li> <li>Share your main takeaway message from the training.</li> </ul>	<ul style="list-style-type: none"> <li>Q &amp; A session</li> <li>Plenary discussions</li> <li>Questionnaires</li> </ul>

## 6.8 Reference materials

### 6.8.1 Participants' handouts

- Training notes on chicken housing and equipment
- Brochures on chicken housing and equipment
- Indigenous chicken farming training manual by KALRO, USDA and Technoserve. 2nd Ed. Ann Mumbi and Laurence Ochieng

### 6.8.2 References

1. KARI (2008) Housing of indigenous (local) chicken. KARI information brochure series / 42 /2008
2. Wachira A., Alaru P A.O., Wangui G., Ouko V.O. & Miano D (2016) Indigenous Chicken Housing



## MODULE 7: CHICK BROODING

### 7.1 Introduction to the Module

Handling of day-old chicks and the management of the brooding programme have a direct relationship to chicken productivity. A newly hatched chick cannot regulate its body temperature. In traditional production systems, mother hen provides the heat for the chicks. As the IC enterprise moves towards commercialisation, artificial brooding becomes necessary as the number of chicks involved is large. In artificial brooding the farmer provides heat and therefore a heat source must be identified. Heat regulation is key to making sure the right temperature for the chicks is maintained.

This module specifies the competencies required to manage indigenous chicken brooding. It involves preparing chick brooder, acquiring day-old chicks, feeding brooder chicks, managing brooder house microclimate, maintaining brooder hygiene, performing chick vaccination, controlling poultry vermin, controlling poultry predators and monitoring chick performance.

### 7.2 Module Learning Outcomes

By the end of the module, the following outcomes should be achieved:

1. Preparation of chick brooder described
2. Accredited hatchery, quality chicks and proper means of transportation identified
3. Feeding of chicks explained.
4. Management of brooding house micro-climate described and explained.
5. Management of brooder hygiene described
6. Standard vaccination procedures explained
7. Monitoring of chick performance demonstrated and explained
8. Brooding using hay box brooder demonstrate and explained



### 7.3 Module Target Groups and Categories

This module targets agricultural extension staff, extension service providers based at County level.

### 7.4 Module Users

This module is intended for use by master trainers who are members of the Core Team of Trainers (CTT) and Farmer Trainers. The module users should thoroughly familiarize themselves with the relevant participant's Participants' handouts and training reference materials.

### 7.5 Module Duration

The Module is estimated to take a minimum of 1 hour.

### 7.6 Module Summary

Manage indigenous chicken brooding			
Sessions	Training Methods	Training Materials	Time
7.6.1 Introduction, module outcomes and expectations	<ul style="list-style-type: none"><li>• Plenary presentation</li><li>• Plenary discussion</li></ul>	<ul style="list-style-type: none"><li>• Projector</li><li>• Laptop</li><li>• Flip charts</li><li>• felt pens</li></ul>	5 minutes
7.6.2 Types and reasons for brooding	<ul style="list-style-type: none"><li>• Group discussion</li><li>• Plenary presentation</li><li>• Plenary discussion</li><li>• Demonstration</li></ul>	<ul style="list-style-type: none"><li>• Projector</li><li>• Laptop</li><li>• Flip charts</li><li>• felt pens</li></ul>	5 minutes
7.6.3. Chick placement	<ul style="list-style-type: none"><li>• Group discussion</li><li>• Plenary presentation</li><li>• Plenary discussion</li><li>• Demonstration</li></ul>	<ul style="list-style-type: none"><li>• Projector</li><li>• Laptop</li><li>• Flip charts</li><li>• Felt pens</li></ul>	10 minutes
7.6.4. Feeding chicks during brooding	<ul style="list-style-type: none"><li>• Group discussion</li><li>• Plenary presentation</li><li>• Plenary discussion</li><li>• Demonstration</li></ul>	<ul style="list-style-type: none"><li>• Flip charts</li><li>• Felt pens</li><li>• Projector</li><li>• laptop</li><li>• Demonstration materials</li></ul>	10 minutes
7.6.5. Managing brooder house micro-climate	<ul style="list-style-type: none"><li>• Group discussion</li><li>• Plenary presentation</li><li>• Plenary discussion</li><li>• Demonstration</li></ul>	<ul style="list-style-type: none"><li>• Projector</li><li>• Laptop</li><li>• Flip charts</li><li>• Felt pens</li><li>• Brooder equipment</li><li>• Demonstration materials</li></ul>	10 minutes

7.6.6. Maintaining brooder hygiene and Vaccination	<ul style="list-style-type: none"> <li>• Group discussion</li> <li>• Plenary presentation</li> <li>• Plenary discussion</li> <li>• Demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Participants handouts</li> <li>• Projector</li> <li>• Laptop</li> <li>• Flip charts</li> <li>• Felt pens</li> </ul>	10 minutes
7.6.7. Monitor Chick performance	<ul style="list-style-type: none"> <li>• Group discussion</li> <li>• Plenary presentation</li> <li>• Plenary discussion</li> <li>• Demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Laptop</li> <li>• Flip charts</li> <li>• Felt pens</li> </ul>	5 minutes
7.6.8 Module review	<ul style="list-style-type: none"> <li>• Group discussion</li> <li>• Plenary presentation</li> </ul>	<ul style="list-style-type: none"> <li>• Felt pens</li> <li>• Projector</li> <li>• Laptop</li> <li>• Flip charts</li> </ul>	5 minutes
<b>TOTAL</b>			<b>1 hour</b>

## 7.7 Facilitators Guidelines

7.7.1 Brooding in Indigenous Chicken	
Introduction and levelling expectations (5 minutes)	Session Guide
<p><i>The Facilitator introduces the module and invites trainees to introduce themselves and give their expectations.</i></p> <p><b>Module objectives</b>  <i>The facilitator presents module objectives</i>  By the end of this module, the trainee should be able to:</p> <ul style="list-style-type: none"> <li>• Describe Preparation of chick brooder</li> <li>• Identify accredited hatchery, quality chicks and proper means of transportation</li> <li>• Explain Feeding of chicks.</li> <li>• Describe and explain management of brooding house micro-climate.</li> <li>• Describe the management of brooder hygiene.</li> <li>• Explain standard vaccination procedures.</li> <li>• Demonstrate and explain the monitoring of chick performance.</li> <li>• Demonstrate and explain brooding using hay box brooder</li> </ul>	<ul style="list-style-type: none"> <li>• Project/Highlight Participants expectations</li> <li>• Participants' handouts</li> </ul>



<b>7.7.2 Types and reason for brooding (5 minutes)</b> <i>The facilitator makes a presentation the main reasons why we need to brood chicks, types of brooders and requirements for brooding</i> <b>Plenary presentation and discussion(5 minutes)</b> <ul style="list-style-type: none"> <li>• Introduction to brooding</li> <li>• Different types of brooding (natural and artificial brooding)</li> <li>• Reasons for brooding chicks.</li> <li>• Requirements for brooding</li> </ul>	<b>Session guide</b> <ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussion</li> <li>• Demonstration</li> <li>• Group work</li> </ul>
<b>7.7.3 Placement and induction of chicks (10 minutes)</b> <b>Plenary Presentation (5 minutes)</b> <ul style="list-style-type: none"> <li>• Choice of litter material for brooding</li> <li>• Brooder preparation</li> <li>• Making of a brooder ring</li> <li>• Pre-heating and conditioning of brooder</li> <li>• Placement of chicks</li> <li>• Induction of the chicks to feeds and water</li> </ul> <b>Plenary discussion (5 minutes)</b> Participants discuss practices related to brooding. Arising questions are answered during this session.	<b>Session guide</b> <ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Group work</li> <li>• Plenary discussions</li> </ul>
<b>7.7.4 Feeding chicks during brooding (10 minutes)</b> <b>Plenary presentation (5 minutes)</b> Chick feeding and watering equipment Setting and spacing of feeding and watering trays  <b>Plenary discussion (5 minutes)</b> Arising questions or issues raised answered during this session.	<b>Session guide</b> <ul style="list-style-type: none"> <li>• PowerPoint Presentation</li> <li>• Plenary discussion</li> </ul>
<b>7.7.5 Managing Brooder house micro-climate (Lighting and heating Management for chicks) (10 minutes)</b>	<b>Session guide</b>
<b>Plenary presentation (5 minutes)</b> <ul style="list-style-type: none"> <li>• Importance of lighting</li> <li>• Lighting programme in relation to chicks</li> <li>• Brooding temperature profile for chicks</li> <li>• Effect of temperature variations in chick behaviour</li> <li>• Sources of heat in brooding</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint Presentation</li> <li>• Flip chart</li> <li>• Plenary discussion</li> </ul>

<b>Plenary discussion (5 minutes)</b> <ul style="list-style-type: none"> <li>Facilitator demonstrate and discuss TIMPs on heating.</li> <li>Participants are divided into groups to make a brooder under guidance of the facilitator. Arising questions are answered during this session.</li> </ul>	
<b>7.7.6 Maintaining Brooder Hygiene (10 minutes)</b>	<b>Session guide</b>
<b>Plenary presentation (10 Minutes)</b> <ul style="list-style-type: none"> <li>Reasons for early chick mortality</li> <li>Prevention of chick mortality</li> <li>Vaccination of chicks</li> </ul>	<ul style="list-style-type: none"> <li>PowerPoint Presentation</li> <li>Flip chart</li> <li>Distribute Participants' handouts</li> </ul>
<b>7.7.8 Module Review (5 minutes)</b>	<b>Session guide</b>
<i>The facilitator leads the participants in reviewing the main points of module. This includes:</i> <ul style="list-style-type: none"> <li>Opportunities identified from the module</li> <li>Main take-home message</li> <li>Issue that need clarification or emphasis</li> </ul>	<ul style="list-style-type: none"> <li>Questions &amp; Answers session</li> <li>Plenary discussions</li> <li>Questionnaires</li> </ul>

## 7.8 Reference materials

### 7.8.1 Participants' handouts

- Training notes on brooding indigenous chicken
- Brooding brochure

### 7.8.2 References

- Wachira A., Alaru P A.O., Wangui G., Ouko V.O. & Miano D (2016) Chick Brooding & Placement
- KARI (2012) Indigenous chicken Training manual. [https://www.kalro.org/csapp/images/SPADE-CLEP-manual\\_July-23-small1.pdf](https://www.kalro.org/csapp/images/SPADE-CLEP-manual_July-23-small1.pdf)
- KARI (2006) Indigenous chicken production manual. *KARI Technical Note No. 18, February 2006* [https://www.kalro.org/fileadmin/publications/tech\\_notes/TecNote18\\_20060810.pdf](https://www.kalro.org/fileadmin/publications/tech_notes/TecNote18_20060810.pdf)





## MODULE 8: PRODUCTION SYSTEMS IN INDIGENOUS CHICKEN

### 8.1 Introduction to the Module

Indigenous chicken farming can be practiced using different production systems. The choice of production system depends on various factors that the farmer needs to consider. These include; the overall objective in choosing to keep indigenous chicken, whether for commercial or subsistence purposes and more importantly, the level of resources at the farmer's disposal. Consideration of these factors ensures that the choice is well aligned with the farmer's objective before embarking on the rest of the planning and preparation. There are three main systems to choose from but various adjustments can be made as appropriate. This module provides information on the three main production systems a farmer may consider before embarking on indigenous chicken production, namely; the traditional free range system, improved semi-free range, and small scale confined systems. It further demonstrates the different types and levels of resources and the respective management aspects that characterise each system.

### 8.2 Module Learning Outcomes

By the end of the module, the following outcomes should be achieved:

1. The main indigenous chicken production systems categorized and explained.
2. The characteristics of the different production systems described.
3. The relevant criteria to consider in choosing a particular production system explained.
4. The linking of farmer objectives, expected outputs, and the choice of appropriate production system described.

5. Assessment of suitable types and levels of resources required in choosing a particular system explained.
6. The merits and demerits of each indigenous chicken production system identified.

### 8.3 Module Target Groups and Categories

This module targets agricultural extension staff, agripreneurs, extension service providers based at County level and lead farmers.

### 8.4 Module duration

This module is estimated to take 1 hour

### 8.5 Module Users

The module is intended for use by master trainers who are members of the Core Team of Trainers (CTT), agripreneurs and lead farmers in the chicken value chain target counties. The facilitator using this module should thoroughly familiarize him/herself with the participant's Participants' handouts.

### 8.6 Module Summary

Production Systems in Indigenous Chicken			
Sessions	Training Methods	Training Materials	Time
8.6.1 Introduction, module outcomes and expectations	<ul style="list-style-type: none"> <li>Plenary presentation</li> <li>Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>Flips charts</li> <li>Felt pens</li> <li>Projector</li> <li>Laptop</li> </ul>	5 minutes
8.6.2 Types and characteristics of IC production systems	<ul style="list-style-type: none"> <li>Plenary presentation</li> <li>Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>Flip charts</li> <li>Felt pens</li> <li>Projector</li> <li>Laptop</li> </ul>	15 minutes
8.6.3 Merits and demerits of each production system	<ul style="list-style-type: none"> <li>Plenary presentation</li> <li>Plenary discussion</li> <li>Case study video session</li> </ul>	<ul style="list-style-type: none"> <li>Flip charts</li> <li>Felt pens</li> <li>Projector</li> <li>Laptop</li> </ul>	20 minutes
8.6.4 Different criteria and resource levels to determine suitable production system	<ul style="list-style-type: none"> <li>Case study video session</li> <li>Plenary discussions</li> </ul>	<ul style="list-style-type: none"> <li>Flip charts</li> <li>Felt pens</li> <li>Projector</li> <li>Laptop</li> </ul>	15 minutes



8.6.5 Module review	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• Felt pens</li> <li>• Projector</li> <li>• Laptop</li> </ul>	5 minutes
<b>TOTAL</b>			<b>1 hours</b>

## 8.7 Facilitator's Guidelines

8.7.1 Self -Introduction, levelling of expectation and setting up of outcomes and expectations (5 minutes)	Session Guide
<p><i>(The facilitator introduces the trainees to the module on production systems in indigenous chicken and thereafter presents the module objectives)</i></p> <p><b>Introduction and trainees' expectations</b>  <i>The facilitator leads trainees to introduce themselves and thereafter organises them into groups to come up with their expectations</i></p> <p><b>Module objectives</b>  <i>(The facilitator presents modules objectives)</i>  By the end of the training module, the trainee should be able to:</p> <ul style="list-style-type: none"> <li>• Categorise and explain the main indigenous chicken production systems</li> <li>• Describe the characteristics of the different production systems</li> <li>• Explain the relevant criteria to consider in choosing a particular production system</li> <li>• Describe the linking of farmer objectives, expected outputs, and the choice of appropriate production system</li> <li>• Explain the assessment of suitable types and levels of resources required in choosing a particular system</li> </ul>	<ul style="list-style-type: none"> <li>• Self-introduction</li> <li>• PowerPoint presentation</li> <li>• Participants' handouts.</li> </ul>

<b>8.7.2 Types and characteristics of IC production systems (15 minutes)</b>	<b>Session Guide</b>
<b>Plenary presentation</b> <ul style="list-style-type: none"> <li>• Chicken production systems</li> </ul> <i>Highlight appropriateness of each production systems on chicken with emphasis on semi-free range housing for indigenous chicken and strategic Semi-Intensive System Supplementation Package (4SIP)</i> <b>Plenary discussion (</b> <ul style="list-style-type: none"> <li>• Types and characteristics of production systems</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussion</li> </ul>
<b>8.7.3 Merits and demerits of each production system (20 minutes)</b>	<b>Session Guide</b>
<i>(The facilitator leads the trainees in discussing merits of different production systems)</i> <b>Plenary Presentation and discussion</b> <ul style="list-style-type: none"> <li>• Identify productions systems</li> <li>• Discuss merits</li> <li>• Discuss the demerits</li> </ul> <b>Case study video session</b> <ul style="list-style-type: none"> <li>• Short video showing indigenous chicken under different production systems</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussion</li> <li>• Case study video session</li> </ul>
<b>8.7.4 Different criteria and resource levels to determine suitable production system (15 minutes)</b>	<b>Session Guide</b>
<b>Case study video session</b> Short video showing indigenous chicken under different production systems	<ul style="list-style-type: none"> <li>• Case study video session</li> <li>• Plenary discussion</li> </ul>
<b>8.7.5 Module review (5 minutes)</b>	<b>Session Guide</b>
<i>The facilitator leads the trainees in reviewing the module.</i> <ul style="list-style-type: none"> <li>• Summarize and review the key points of the training module with the trainees, focusing on climate-smart agriculture practices.</li> <li>• Reflect on newly acquired knowledge from this module.</li> <li>• Discuss emerging problems and issues that have gained awareness during the module.</li> <li>• Share your main takeaway message from the training.</li> </ul>	<ul style="list-style-type: none"> <li>• Questions &amp; Answers session</li> <li>• Plenary discussions</li> <li>• Questionnaires</li> </ul>



## **8.8 Reference materials**

### **8.8.1 Participants' handouts**

- Training notes on production systems in indigenous chicken

### **8.8.2 References**

1. KARI (2012) Indigenous chicken Training manual. [https://www.kalro.org/csapp/images/SPADE-CLEP-manual\\_July-23-small1.pdf](https://www.kalro.org/csapp/images/SPADE-CLEP-manual_July-23-small1.pdf)
2. Ngeno, K., Alaru, P.A.O., Magothe, M., Wasike, C.B., Ochieng, O.V., K'Oloo, T.O., and Ilatsia, E.D. ( 2022). Growth performance of KALRO climate-smart indigenous chicken breed lines under free-range production environments.



## MODULE 9: FEEDS AND FEEDING OF INDIGENOUS CHICKEN

### 9.1 Introduction to the Module

Feeding plays a crucial role in enhancing the production of meat and eggs in chicken. The absence of adequate feed or water not only compromises the resistance of chickens to diseases and parasites but also contributes to a higher mortality rate within the flock. Particularly, indigenous chicken face the risk of starvation during certain periods, such as droughts or when confined during planting seasons, if left to scavenge without supplementary feeding.

Egg production and overall growth are inherently linked to the quality of feed, access to water, and the genetic potential of the chicken. Despite the challenges posed by their lower production potential and susceptibility to environmental fluctuations, local chicken breeds exhibit the ability to convert feed into eggs. However, to unlock their full potential, supplementary feeds become crucial. This is also true for genetically improved breeds, which thrive under rural conditions when provided with a consistent supply of high-quality feeds.

The dynamics of feeds and feeding costs vary across free-range, semi-intensive, and intensive poultry production systems. Consequently, the profitability of chicken farming is closely tied to the chosen feeding approach. This module covers the requirements for the economic management and feeding of chicken, encompassing a thorough understanding of the significance of chicken nutrition.

### 9.2 Learning Outcomes

By the end of the module, the following outcomes should be achieved:

1. The importance of feeding chicken explained



2. What and how much to feed chicken identified and explain
3. The formulation and compounding of chicken feeds described
4. Equipment for compounding chicken feeds identified and explained
5. Simple production and utilization of termites, cockroaches, moringa leaf meal, and black soldier fly (BSF) described
6. Management of common feedstuff problems explained
7. The effective use of feeders and drinkers demonstrated and explained

### 9.3 Target Group and Categories

This module targets agricultural extension officers, extension service providers based at the county level, cooperatives and agripreneurs.

### 9.4 Module Users

The module is intended for use by master trainers who are members of the Core Team of Trainers (CTT), agripreneurs and Lead Farmers in indigenous chicken value chain target Counties. The facilitator using this module should thoroughly familiarize him/herself with the participant's handouts.

### 9.5 Module Duration

The Module is estimated to take 4 hours.

### 9.6 Module Summary

Feeds and Feeding of Chicken			
Sessions	Training Methods	Training Materials	Time
9.6.1 Introduction, module objectives and trainees' expectations	<ul style="list-style-type: none"> <li>Self-Introductions</li> <li>Plenary presentation</li> <li>Group discussion</li> </ul>	<ul style="list-style-type: none"> <li>Flip charts</li> <li>Felt pens</li> <li>Projector</li> <li>Laptop</li> </ul>	5 minutes
9.6.2 Chicken feeding guidelines	<ul style="list-style-type: none"> <li>Group discussions</li> <li>Plenary presentation</li> </ul>	<ul style="list-style-type: none"> <li>Flip charts</li> <li>Felt pens</li> <li>Projector</li> <li>Laptop</li> </ul>	20 minutes
9.6.3 Classification of Chicken Categories	<ul style="list-style-type: none"> <li>Group discussions</li> <li>Plenary presentation</li> </ul>	<ul style="list-style-type: none"> <li>Flip charts</li> <li>Felt pens</li> <li>Projector</li> <li>Laptop</li> </ul>	10 minutes

9.5.4 Chicken feed budgeting	<ul style="list-style-type: none"> <li>• Plenary discussion</li> <li>• Plenary presentation</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• Felt pens</li> <li>• Projector</li> <li>• Laptop</li> </ul>	20 minutes
9.6.5 Chicken feeding equipment	<ul style="list-style-type: none"> <li>• Plenary discussion</li> <li>• Plenary presentation</li> <li>• Practical demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• Felt pens</li> <li>• Projector</li> <li>• Laptop</li> <li>• Demonstration materials</li> </ul>	20 minutes
9.6.6 Types and classification of chicken stuffs	<ul style="list-style-type: none"> <li>• Plenary discussion</li> <li>• Plenary presentation</li> <li>• Group exercises</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• Felt pens</li> <li>• Projector</li> <li>• Demonstration materials</li> </ul>	30 minutes
9.6.7 Challenges related to feeds, feeding and feedstuffs for chicken	<ul style="list-style-type: none"> <li>• Plenary discussion</li> <li>• Plenary presentation</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• Felt pens</li> <li>• Projector</li> <li>• Video clips</li> <li>• Demonstration materials</li> <li>• Photos</li> </ul>	40 minutes
9.6.8 Chicken feed formulation and formulation methods	<ul style="list-style-type: none"> <li>• Group Discussion</li> <li>• Case study video session</li> <li>• Audio-visuals</li> <li>• Group exercises</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• Felt pens</li> <li>• Projector</li> <li>• laptop</li> <li>• Video clips</li> <li>• Photos</li> </ul>	35 minutes
9.6.9 Equipment for compounding chicken feed	<ul style="list-style-type: none"> <li>• Plenary discussion</li> <li>• Plenary presentation</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• Felt pens</li> <li>• Projector</li> <li>• Photos</li> <li>• Laptop with spreadsheet</li> <li>• Single Pearson square</li> <li>• Double Pearson</li> </ul>	20 minutes



9.6.10 Practical feed mixing	<ul style="list-style-type: none"> <li>• Demonstration</li> <li>• Group exercises</li> </ul>	<ul style="list-style-type: none"> <li>• shovels(spades)</li> <li>• Feed ingredients</li> <li>• Feed packaging materials</li> <li>• Digital weighing scale</li> <li>• Scooper</li> <li>• Feed formulas</li> </ul>	30 minutes
8.6.11 Module review	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• Felt pens</li> <li>• Projector</li> <li>• Laptop</li> </ul>	10 minutes
<b>TOTAL</b>			<b>4 hours</b>

## 9.7 Facilitator's Guidelines

Feeds and feeding of Chicken	
9.7.1 Introduction, outcomes and expectations (5 minutes)	Session Guide
<p><b>Introduction</b>  <i>The facilitator welcomes trainees and introduces them to the module on feeds and feeding.</i></p> <p><b>Module Objectives</b>  <i>The facilitator presents the modules objectives and invites participants to discuss.</i></p> <p>By the end of the module, trainees should be able to:</p> <ul style="list-style-type: none"> <li>• Explain the importance of feeding chicken</li> <li>• Identify and explain what and how much to feed chicken</li> <li>• Describe the formulation and compounding of chicken feeds</li> <li>• Identify and explain the equipment for compounding chicken feeds</li> <li>• Describe simple production and utilization of termites, cockroaches, moringa leaf meal, and black soldier fly (BSF).</li> <li>• Explain the management of common feedstuff problems</li> </ul>	<ul style="list-style-type: none"> <li>• Summarise trainees' expectations using cards or any appropriate method.</li> <li>• PowerPoint presentation</li> <li>• Participants' handouts</li> </ul>

9.7.2 Chicken feeding guidelines (20 hour)	Session guide
<p><i>The facilitator makes a presentation on the chicken feeding guidelines.</i></p> <p><b>Plenary presentation</b></p> <ul style="list-style-type: none"> <li>• The importance of feeding IC</li> <li>• Estimated feed intake for IC</li> <li>• Feeding of IC under different production systems</li> <li>• Cafeteria feeding system</li> </ul> <p><b>Plenary discussion</b></p> <p><i>Trainees review what they have learned and engage in discussions regarding any arising issues. Questions are addressed within this session as well.</i></p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussion</li> </ul>
9.7.3 Classification of chicken feed categories ( 10 minutes)	Session guide
<p><i>The facilitator guides trainees in understanding the different categories of poultry feeds while focusing on availability in the trainees locality</i></p> <p><b>Plenary presentation</b></p> <p><i>The facilitator explains the nutritional specifications for various categories of chickens.</i></p> <ul style="list-style-type: none"> <li>• Chick mash</li> <li>• Growers mash</li> <li>• Layers mash</li> <li>• Breeders mash</li> <li>• Kienyeji mash</li> </ul> <p><b>Plenary discussion</b></p> <p><i>Participants review what they have learned and engage in discussions regarding any arising issues. Questions are addressed within this session as well.</i></p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussion</li> </ul>
9.7.4 Chicken feed budgeting (30 minutes)	Session guide
<p><i>The facilitator guides trainees in comprehending the process of creating a straight forward chicken feed budget. Subsequently, exercises are assigned to participants based on the provided examples.</i></p> <p><b>Plenary presentation and discussion</b></p> <p><i>The facilitator guides participants on how to make a budget for the following feeds :</i></p> <ul style="list-style-type: none"> <li>• Chick mash</li> <li>• Growers mash</li> <li>• Layers mash</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Flip charts</li> <li>• Plenary discussions</li> </ul>



<p><b>Plenary discussion</b></p> <p><i>Participants review what they have learned and engage in discussions regarding any arising issues. Questions are addressed within this session as well</i></p>	
<p><b>9.7.5 Chicken feeding equipment 20 minutes</b></p>	<p><b>Session guide</b></p>
<p><b>Plenary presentation and practical demonstration</b></p> <ul style="list-style-type: none"> <li>• Different equipment used in feeding chicken</li> <li>• The different chicken feeders in the market</li> <li>• The different chicken drinkers in the market</li> <li>• How to make KALRO-Naivasha long feeder</li> <li>• How to make KALRO Jerry Can drinker</li> </ul> <p><b>Plenary discussion</b></p> <p><i>Trainees review what they have learned and discuss on arising issues. Questions are addressed within this session as well</i></p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussions</li> <li>• Practical demonstration</li> </ul>
<p><b>9.7.6 Types and classification of chicken feedstuffs (20 minutes)</b></p>	<p><b>Session guide</b></p>
<p><i>The facilitator guides trainees' in a discussion about various classes of feeds, with a particular emphasis on locally available resources.</i></p> <p><b>Plenary presentation</b></p> <ul style="list-style-type: none"> <li>• Energy</li> <li>• Protein</li> <li>• Macro nutrients</li> <li>• Feed additives</li> <li>• Novel feedstuffs (BSF, cockroaches, moringa leaf meal, sorghum, cassava)</li> </ul> <p><b>Plenary discussion</b></p> <p><i>Participants review what they have learned and engage in discussions regarding any arising issues. Questions are addressed within this session as well.</i></p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussions</li> </ul>
<p><b>9.7.7 Challenges related to feeds, feeding and feedstuffs for chicken (40 minutes)</b></p>	<p><b>Session guide</b></p>
<p><i>The facilitator leads the trainees in identifying challenges in feeding, feeds and feedstuffs and discusses amicable solutions.</i></p> <p><b>Plenary presentation and discussion</b></p> <ul style="list-style-type: none"> <li>• Anti-nutritional factors</li> <li>• Feed additives</li> <li>• Antibiotics</li> <li>• Probiotics, prebiotics and postbiotics</li> <li>• Fats</li> <li>• Synthetic Amino Acids</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussion</li> </ul>

<b>9.7.8 Chicken feed formulation and formulation methods (35 minutes)</b>	<b>Session guide</b>
<b>Plenary Presentation</b> <ul style="list-style-type: none"> <li>Principles of feed formulation</li> <li>Feed formulation methods</li> <li>Exercise on each feed method</li> <li>KAPOFF in Chicken feed formulation</li> </ul> <b>Plenary Discussion</b> <ul style="list-style-type: none"> <li>Feed formulation and methods</li> </ul>	<ul style="list-style-type: none"> <li>PowerPoint presentation</li> <li>Plenary Discussion</li> </ul>
<b>9.7.9 Equipment for compounding chicken feed (20 minutes)</b>	<b>Session guide</b>
<i>The facilitator leads trainees in identifying and appreciating different machines and equipment in feed processing, mixing, and packaging</i>  <b>Plenary presentation and discussion</b> <ul style="list-style-type: none"> <li>Hammer mills</li> <li>Mixers</li> <li>Pelleting machine</li> </ul>	<ul style="list-style-type: none"> <li>PowerPoint presentation</li> <li>Plenary discussion</li> </ul>
<b>9.6.10 Practical feed mixing (30 minutes)</b>	<b>Session guide</b>
<b>Group exercise</b> <i>The facilitator leads the trainee in manual feed mixing using a shovel and a formula they derived during the formulation exercise</i>	<ul style="list-style-type: none"> <li>Feed formulae</li> <li>Feed ingredients</li> <li>Shovel</li> </ul>
<b>9.6.11 Module Review (10 minutes)</b>	<b>Session guide</b>
<i>The facilitator leads the participants in reviewing the module</i> <ul style="list-style-type: none"> <li>Summarize and review the main points of the training</li> <li>Opportunities identified from the module</li> <li>Main take-home message</li> </ul>	<ul style="list-style-type: none"> <li>Q &amp; A session</li> <li>Discussions</li> <li>Questionnaires</li> <li>Any other</li> </ul>

## 9.7 Reference materials

### 9.7.1 Participants' handouts

- Training notes on feeds and feeding of chicken

### 9.7.2 Participants' handouts

- Alaru P A.O., Wangui G., Ouko V.O. Wachira A. & Miano D (2016) Feeding Indigenous Chicken
- KARI (2012) Indigenous chicken Training manual. [https://www.kalro.org/csapp/images/SPADE-CLEP-manual\\_July-23-small1.pdf](https://www.kalro.org/csapp/images/SPADE-CLEP-manual_July-23-small1.pdf)





## **MODULE 10: INDIGENOUS CHICKEN BREEDER FLOCK MANAGEMENT**

### **10.1 Introduction to the Module**

Breeding and multiplication of improved indigenous chicken plays a critical role in the advancement of the sub-sector. Good production practices, including biosecurity and disease control, ensure both breed accuracy and the supply of strong, healthy chicks or breeding birds to grower farms. This module outlines the skills and knowledge required to effectively manage an indigenous chicken breeder flock. It covers essential tasks such as feeding laying birds, cleaning feeding and watering equipment, maintaining suitable litter conditions, managing chicken house micro-climate, monitoring flock health and performance, handling chicken eggs, and maintaining accurate records.

### **10.2 Module Learning Outcomes**

By the end of this module, the following outcomes should be achieved:

1. The feeding requirements of breeder flock birds explained.
2. Feeding and watering equipment demonstrated and explained.
3. Maintenance of suitable litter conditions in a poultry house described.
4. Principles of managing chicken house microclimate for optimal bird health and performance outlined and explained.
5. Effective strategies for managing the health of a breeder flock described.
6. Monitoring and recording key performance indicators of a breeder flock explained.
7. Proper handling and grading procedures for breeder flock eggs outlined and explained.
8. Accurate and up-to-date records of breeder flock performance and management practices described.

### 10.3 Module Target Group

This module targets agricultural extension, extension service providers based at the county level and lead farmers.

### 10.4 Module Users

This module targets agricultural extension service providers and agripreneurs dealing directly with farmer groups at the community level or community facilitators.

### 10.5 Module Duration

The Module is estimated to take about 1 hour/

### 10.6 Module Summary

Indigenous chicken breeder flock management			
Sessions	Training Methods	Training Materials	Time
10.6.1 Introduction, module outcomes and expectations	<ul style="list-style-type: none"><li>• Plenary presentation</li><li>• Plenary discussion</li></ul>	<ul style="list-style-type: none"><li>• Flip charts</li><li>• Felt pens</li><li>• Projector /Laptop</li></ul>	5 minutes
10.6.2 Feeding Breeder flock	<ul style="list-style-type: none"><li>• Plenary discussion</li><li>• Plenary presentation</li></ul>	<ul style="list-style-type: none"><li>• Projector</li><li>• Laptop</li><li>• Flip charts</li><li>• Felt pens</li></ul>	5 minutes
10.6.3 Cleaning feeding and watering equipment	<ul style="list-style-type: none"><li>• Plenary presentation</li><li>• Plenary discussion</li><li>• Demonstrations</li></ul>	<ul style="list-style-type: none"><li>• Projector</li><li>• Flip charts</li><li>• Felt pens</li></ul>	5 minutes
10.6.4 Maintaining suitable litter condition	<ul style="list-style-type: none"><li>• Plenary presentation</li><li>• Plenary discussions</li></ul>	<ul style="list-style-type: none"><li>• Projector</li><li>• Laptop</li><li>• Flip chart,</li><li>• Participants' handouts</li><li>• Demonstration materials</li></ul>	5 minutes
10.6.5 Monitoring breeder flock performance	<ul style="list-style-type: none"><li>• Plenary presentation</li><li>• Plenary discussions</li></ul>	<ul style="list-style-type: none"><li>• Projector</li><li>• Laptop</li><li>• Flip chart</li><li>• Participants' handouts</li></ul>	10 minutes
10.6.6 Handling chicken eggs	<ul style="list-style-type: none"><li>• Plenary presentation</li><li>• Plenary discussions</li><li>• Demonstrations</li></ul>	<ul style="list-style-type: none"><li>• Projector</li><li>• Laptop</li><li>• Flip chart</li><li>• Participants' handouts</li></ul>	10 minutes



10.6.7 Chicken house light management	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Plenary discussions</li> <li>• Demonstrations</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Laptop</li> <li>• Flip chart</li> <li>• Participants' handouts</li> </ul>	<u>10 minutes</u>
10.6.8 Record maintenance	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Plenary discussions</li> </ul>	Projector Laptop Flip chart Participants' handouts	<u>10 minutes</u>
10.6.9 Module review	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Plenary discussion</li> </ul>	Flip chart Projector Laptop	<u>5 minutes</u>
<b>TOTAL</b>			<b>1 hours</b>

## 10.7 Facilitator's Guidelines

<b>Indigenous chicken breeder flock management</b>	
<b>10.7.1 Introduction and levelling expectations (5 minutes)</b>	<b>Session Guide</b>
<p><i>The facilitator welcomes trainees to the module and invites them to give their expectations.</i></p> <p>By the end of the module, the trainees should be able to:</p> <ul style="list-style-type: none"> <li>• Explain the feeding requirements of breeder flock birds</li> <li>• Demonstrate and explain feeding and watering equipment</li> <li>• Describe the maintenance of suitable litter conditions in a poultry house.</li> <li>• Outline and explain the principles of managing chicken house microclimate for optimal bird health and performance</li> <li>• Describe effective strategies for managing the health of a breeder flock</li> <li>• Explain monitoring and recording key performance indicators of a breeder flock.</li> <li>• Outline and explain proper handling and grading procedures for breeder flock eggs.</li> <li>• Describe accurate and up-to-date records of breeder flock performance and management practices.</li> </ul>	<ul style="list-style-type: none"> <li>• Trainee's expectations</li> <li>• Participants' handouts</li> </ul>

<b>10.7.2 Feeding breeder flock (5 hours)</b>	<b>Session guide</b>
<b>Plenary presentation and discussion(5 minutes)</b> <ul style="list-style-type: none"> <li>• Feed requirements of layers</li> <li>• Form of diet</li> <li>• Feeding with grit</li> <li>• The importance of calcium in breeder flock diets</li> <li>• Feeding with green feedstuffs</li> <li>• Water requirements of layers</li> <li>• Feeders and waterers</li> </ul>	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Plenary discussion</li> </ul>
<b>10.7.3 Cleaning feeding and watering equipment (5 minutes)</b>	<b>Session guide</b>
<i>The facilitator makes a presentation and leads discussion on cleaning equipment meant to be used in a chicken house</i> <b>Plenary presentation and discussion (5 minutes)</b> <ul style="list-style-type: none"> <li>• Types of detergents and sanitizers used</li> <li>• Methods used for disinfection of equipment</li> <li>• Cleaning procedures for feeders, waterers and poultry house</li> <li>• Sanitizing procedures for feeders and waterers.</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussion</li> <li>• Demonstration</li> <li>• Use of flip charts</li> </ul>
<b>10.7.4 Maintaining suitable litter condition (5 minutes)</b>	<b>Session guide</b>
<b>Plenary Presentation and discussion (5 minutes)</b> <ul style="list-style-type: none"> <li>• Role of litter in poultry house</li> <li>• Factors determining the choice of litter material</li> <li>• Common litter defects</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Flip charts</li> <li>• Group work</li> <li>• Plenary discussions</li> </ul>
<b>10.7.5 Monitoring breeder flock performance (10 minutes)</b>	<b>Session guide</b>
<b>Plenary Presentation (5 minutes)</b> <ul style="list-style-type: none"> <li>• Growth and development pattern</li> <li>• Breeder flock behaviour at lay</li> <li>• Layer vices</li> <li>• Factors influencing egg quantity and quality</li> <li>• Evaluation of egg production performance</li> <li>• Broodiness in breeder flock</li> </ul> <b>Plenary discussion (5 minutes)</b> <ul style="list-style-type: none"> <li>• Any questions or issues raised are answered during this session.</li> </ul>	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Participants' handouts</li> <li>• Plenary discussion</li> </ul>



10.7.6 Handling chicken eggs (10 minutes)	Session guide
<p><i>The facilitator makes a presentation on handling eggs (5 minutes)</i></p> <ul style="list-style-type: none"> <li>• Frequency of egg collection</li> <li>• Ensuring cleanliness of eggs</li> <li>• Storage of eggs after collection from laying houses</li> <li>• Appropriate age for egg selection</li> <li>• Determination of appropriate shell quality and shape index</li> <li>• Temperature stabilization during egg storage</li> </ul> <p><b>Plenary discussion (5 minutes)</b>  <i>Any questions or issues raised are answered during this session.</i></p>	<ul style="list-style-type: none"> <li>• PowerPoint Presentation</li> <li>• Flip chart</li> <li>• participants' handouts</li> <li>• Plenary discussion</li> </ul>
10.7.7 Chicken house light management (10 minutes)	Session guide
<p><b>Plenary Presentation (5 minutes)</b></p> <ul style="list-style-type: none"> <li>• Importance and disadvantages of lighting</li> <li>• Lighting programme in relation to age of the flock</li> </ul> <p><b>Plenary discussion (5 minutes)</b>  Any question answered during this session.</p>	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Participants' handouts</li> <li>• Plenary discussion</li> </ul>
10.7.8 Module review (5 minutes)	Session guide
<p><i>The facilitator leads the participants in reviewing the module</i></p> <p>Summarize and review the main points of the training with the participants about breeder flock management</p> <ul style="list-style-type: none"> <li>• What opportunities have you identified from the module?</li> <li>• Main take-home message</li> <li>• Any issue that need clarity or emphasis</li> </ul>	<ul style="list-style-type: none"> <li>• Q &amp; A session</li> <li>• Discussions</li> <li>• Questionnaires 0</li> </ul>

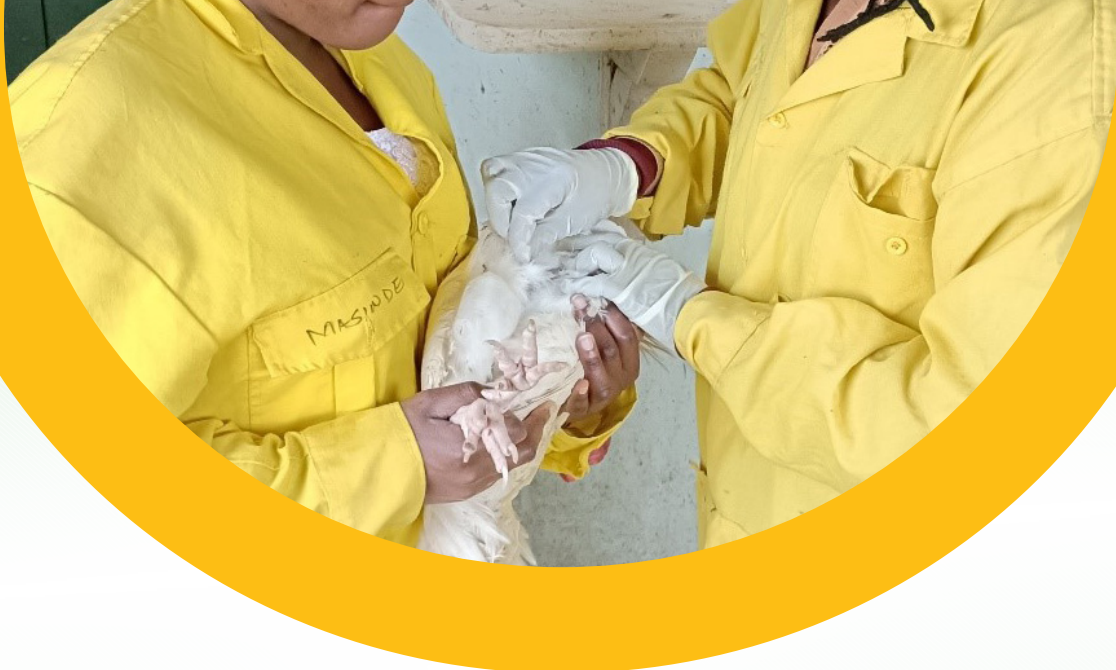
## 10.8 Reference materials

### 10.8.1 Participants' handouts

- KALRO IC Breed brochure
- Training notes on indigenous chicken breeder flock management

### 10.8.2 References

1. KARI (2006) Indigenous chicken production manual. KARI Technical Note No. 18, February 2006 [https://www.kalro.org/fileadmin/publications/tech\\_notes/TecNote18\\_20060810.pdf](https://www.kalro.org/fileadmin/publications/tech_notes/TecNote18_20060810.pdf)



## MODULE 11: INDIGENOUS CHICKEN HEALTH MANAGEMENT

### 11.1 Introduction to the Module

The Indigenous Chicken (IC) health management module will expose trainees to important pests, parasites and infectious diseases of indigenous chicken, which cause significant losses due to mortalities and reduced productivity. Trainees will be exposed to causes and spread of infectious diseases, biosecurity and its importance in prevention of diseases in IC flocks. Common infectious (viral and bacterial) diseases and their control as well as the important pests and parasites that affect indigenous chicken will also be extensively covered. This module will impact knowledge and skills on control of important infectious diseases, pests and parasites which reduce productivity and performance of IC. The key beneficiaries will be the livestock extension service providers, and agriprenuers based at the sub-county and ward levels. It will also equip private livestock extension service providers with knowledge and skills to control health challenges in IC by dealing directly with farmer groups at the community level and lead farmers.

### 11.2 Module Learning Outcomes

1. By the end of the module, the following outcomes should be achieved:
2. Management of indigenous chicken biosecurity understood and articulated.
3. Indigenous chicken health equipment and materials identified.
4. The Management of indigenous chicken vaccination procedures described.
5. Control of indigenous chicken pests and parasites identified and explained.
6. Management indigenous chicken vices explained.
7. Keeping and management of health records described.



### 11.3 Module Target Group and categories

This module targets livestock extension service providers and agri-prenuers based at the sub county and ward levels. It will also be used by private livestock extension service providers dealing directly with farmer groups at the community level and lead farmers.

### 11.4 Module users

This module is intended for use by master trainers who are members of the core team trainers (CTT), lead farmers and agri-prenuers in the IC value chain in target counties. The facilitators using this module should thoroughly familiarize themselves with the hand outs (training materials)

### 11.5 Module duration

The module is estimated to take 2 hours.

### 11.6 Module summary

Indigenous Chicken Health Management			
Sessions	Training Methods	Training Materials	Time
11.6.1 Introduction, module outcomes and expectations	<ul style="list-style-type: none"><li>• Self-introduction</li><li>• Group exercise</li><li>• Plenary presentation</li><li>• Plenary discussion</li></ul>	<ul style="list-style-type: none"><li>• Flips charts</li><li>• Felt pens</li><li>• PowerPoint presentation</li><li>• Laptop</li><li>• Projector</li></ul>	5 minutes
11.6.2 Biosecurity indigenous chicken rearing	<ul style="list-style-type: none"><li>• Group work</li><li>• Plenary presentation</li><li>• Plenary discussion</li></ul>	<ul style="list-style-type: none"><li>• Flip charts</li><li>• Power point presentation</li><li>• Laptop</li><li>• Projector</li><li>• Participant handouts</li></ul>	10 minutes
11.6.3 Overview of causes and spread of diseases in Indigenous Chicken	<ul style="list-style-type: none"><li>• Group work</li><li>• Plenary presentation</li><li>• Plenary discussion</li></ul>	<ul style="list-style-type: none"><li>• Power point presentation</li><li>• Laptop</li><li>• Projector</li><li>• Participants' handouts</li></ul>	15 minutes
11.6.4 Important bacterial diseases of Indigenous Chicken	<ul style="list-style-type: none"><li>• Group work</li><li>• Plenary presentation</li><li>• Plenary discussion</li><li>• Practical session</li></ul>	<ul style="list-style-type: none"><li>• Power point presentation</li><li>• Laptop</li><li>• Projector</li><li>• Participants' handouts</li></ul>	30 minutes

11.6.5 Important viral disease of Indigenous Chicken	<ul style="list-style-type: none"> <li>• Group work</li> <li>• Plenary presentation</li> <li>• Plenary discussion</li> <li>• Practical session</li> </ul>	<ul style="list-style-type: none"> <li>• Power point presentation</li> <li>• Laptop</li> <li>• Projector</li> <li>• Participant' handouts</li> </ul>	30 minutes
11.6.7 Indigenous chicken Vaccination	<ul style="list-style-type: none"> <li>• Group work</li> <li>• Plenary presentation</li> <li>• Plenary discussion</li> <li>• Practical session</li> </ul>	<ul style="list-style-type: none"> <li>• Power point presentation</li> <li>• Laptop</li> <li>• Projector</li> <li>• Participants' handouts</li> </ul>	20 minutes
11.6.8 safe handling of veterinary drugs and chemicals	<ul style="list-style-type: none"> <li>• Group work</li> <li>• Plenary presentation</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Power point presentation</li> <li>• Laptop</li> <li>• Projector</li> <li>• Participant handouts</li> </ul>	5 minutes
11.6.9 Module review	<ul style="list-style-type: none"> <li>• Plenary discussion</li> <li>• Module recap</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluation Form.</li> </ul>	5 minutes
<b>TOTAL</b>			<b>2 hours</b>

## 11.7 Facilitator guidelines

Module 4: Indigenous Chicken health management	
11.7.1. Introduction, Levelling Expectations and objectives (5 minutes)	Session Guide
<p><b>Introduction</b>  <i>The facilitator welcomes trainees to the module, and welcomes them to introduce themselves and state their expectations.</i></p> <p><b>Module objectives</b>  <i>(The facilitator presents module objectives)</i>            By the end of the training module, the trainees should be able to;</p> <ul style="list-style-type: none"> <li>• Articulate the management of indigenous chicken biosecurity.</li> <li>• Identify indigenous chicken health equipment and materials.</li> <li>• Describe Management of indigenous chicken vaccination procedures.</li> <li>• Explain the control of indigenous chicken pests and parasites identified and explained.</li> <li>• Explain the management indigenous chicken vices.</li> <li>• Describe and explain keeping and management of health records.</li> </ul>	<ul style="list-style-type: none"> <li>• Summarize participant expectations and display them.</li> <li>• PowerPoint presentation</li> <li>• Distribute participants' handouts</li> </ul>



<b>11.7.2 Biosecurity in indigenous chicken rearing (10 minutes)</b>	<b>Session guide</b>
<p><i>(The facilitator guides trainees on biosecurity measures in indigenous chicken rearing)</i></p> <p><b>Group work</b></p> <ul style="list-style-type: none"> <li>• Trainees to list some of the biosecurity measures/ structures they undertake in their counties.</li> </ul> <p><b>Plenary presentation</b></p> <ul style="list-style-type: none"> <li>• PowerPoint presentation on effective implementation of biosecurity measures in the farm and its importance</li> </ul> <p><b>Plenary discussion</b></p> <ul style="list-style-type: none"> <li>• In plenary discussion ask them to share their experience on implementation of biosecurity measures in their farms.</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Distribute participants' handouts</li> <li>• Biosecurity guidelines.</li> <li>• Printed photos of some biosecurity measures.</li> </ul>
<b>11.7.3 Overview of causes and spread of diseases of indigenous chicken (15 minutes)</b>	<b>Session Guide</b>
<p><i>(The facilitator guides trainees on the common causes and spread of diseases in indigenous chicken flocks)</i></p> <p><b>Group work</b></p> <p>Trainees to think about the common causes and spread of diseases in their counties.</p> <p><b>Plenary presentation</b></p> <ul style="list-style-type: none"> <li>• Disease causes and how they spread.</li> <li>• Losses resulting from diseases</li> </ul> <p><b>Discussion</b></p> <p><i>Let the trainees recall what they have learned and discuss any issue that may arise.</i></p>	<ul style="list-style-type: none"> <li>• Group work</li> <li>• Plenary presentation</li> <li>• Plenary discussion</li> </ul>
<b>11.7.4. Important bacterial diseases of indigenous chicken (30 minutes)</b>	<b>Session Guide</b>
<p><i>(The facilitator guides the trainees in identifying important bacterial diseases affecting indigenous chicken.</i></p> <p><b>Group work</b></p> <ul style="list-style-type: none"> <li>• Trainees to discuss on the important bacterial diseases in their counties</li> </ul> <p><b>Plenary presentation and discussion</b></p> <ul style="list-style-type: none"> <li>• Presentation on the important bacterial diseases and conditions that favor their occurrence.</li> <li>• Fowl typhoid</li> <li>• Avian salmonellosis</li> <li>• Infectious Coryza</li> <li>• Avian colibacillosis</li> </ul> <p><b>Practical exercise</b></p> <ul style="list-style-type: none"> <li>• Trainees to participate in the identification of important bacterial diseases using printed photos.</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Distribute participants' handouts</li> <li>• Disease identification guidelines.</li> <li>• Printed photos of the important bacterial disease</li> </ul>

11.7.5 Important viral diseases of indigenous chicken (30 minutes)	Session Guide
<p><b>Group work</b></p> <ul style="list-style-type: none"> <li>• Trainees to deliberate common viral disease in their counties.</li> </ul> <p><b>Plenary presentation and discussion.</b></p> <ul style="list-style-type: none"> <li>• Presentations on important viral diseases and conditions that favour their occurrence</li> <li>• Newcastle Disease</li> <li>• Fowl pox</li> <li>• Gumboro</li> <li>• Infectious bronchitis</li> <li>• Mareks.</li> </ul> <p><b>Plenary discussion</b></p> <ul style="list-style-type: none"> <li>• In plenary discussion ask them to share the farmers' experience on recognition and coping strategies during outbreaks</li> <li>• Presentation on identification of the common pests/parasites, symptoms and their management options.</li> <li>• External parasites (soft ticks, mites, fleas and lice)</li> <li>• Internal parasites (worms and coccidia)- aloe secundi-flora herbal extract (ASHE)</li> <li>• Prevention and control methods</li> </ul> <p><b>Practical session</b> Trainees to participate in identification of common viral diseases using printed photos.</p>	<ul style="list-style-type: none"> <li>• Distribute participants' handouts</li> <li>• Disease identification guidelines.</li> <li>• Printed photos of the important viral disease.</li> </ul>
11.7.6 Vaccination against Infectious diseases of indigenous chicken (20 minutes)	Session Guide
<p><b>Group work.</b></p> <ul style="list-style-type: none"> <li>• Trainees to list common vaccinations they conduct in their counties</li> </ul> <p><b>Plenary presentation</b></p> <ul style="list-style-type: none"> <li>• PowerPoint presentation on vaccine handling, administration and vaccinations schedules for different diseases affecting indigenous chicken.</li> <li>• Common vaccines in Kenya which include:             <ol style="list-style-type: none"> <li>1. Monovalent Gumboro vaccine.</li> <li>2. Bivalent Newcastle and gumboro vaccine</li> <li>3. Thermostable Newcastle vaccine- AVIVAX-I2</li> </ol> </li> </ul> <p><b>Plenary Discussion</b> In plenary discussion trainees to give their experience on the effectiveness of vaccination in controlling diseases in indigenous chicken</p> <p><b>Practical session</b> Guide trainees on oral vaccine administration process</p>	<ul style="list-style-type: none"> <li>• Distribute participants' handouts</li> <li>• Vaccination handling guidelines.</li> <li>• Printed vaccination schedules.</li> </ul>



11.7.8 Safe handling of veterinary drugs and chemicals (5 minutes)	Session Guide
<p><b>Group work</b></p> <ul style="list-style-type: none"> <li>• Trainees to have an exercise on ways they use to safely handle veterinary drugs and chemicals.</li> </ul> <p><b>Plenary presentation</b></p> <ul style="list-style-type: none"> <li>• Presentation on common categories of veterinary drugs and chemicals which include;             <ol style="list-style-type: none"> <li>1. Antibiotics</li> <li>2. Accaricides</li> <li>3. Fungicides</li> <li>4. disinfectants</li> </ol> </li> <li>• Presentation on safe use of veterinary drugs and chemicals.</li> </ul> <p><b>Plenary Discussion</b></p> <p>In plenary discussion ask them to give their experience on the uses of veterinary drugs and chemicals and some of the ways they are abused.</p>	<ul style="list-style-type: none"> <li>• Distribute handouts on safe handling of veterinary drugs and chemicals.</li> <li>• PowerPoint presentation</li> <li>• Group exercise</li> </ul>
11.7.9 Module Review: Presentation and Discussion (5 minutes)	Session Guide
<p><i>(The facilitator lets the trainees in reviewing the module)</i></p> <p>Summarize the main points of the training together with trainees.</p> <ul style="list-style-type: none"> <li>• Discuss with trainees about new lessons learnt.</li> <li>• Address issues that need clarification.</li> </ul>	<ul style="list-style-type: none"> <li>• Participants handouts</li> <li>• Summarize the main points from the module on a flip chart and display.</li> </ul>

## 11.8 Reference materials

### 11.8.1 Participants' handouts

- Training notes on overview of diseases, causes and spread.
- Training notes on important bacterial diseases and their control
- Training notes on important viral diseases and their control
- Training notes on important pests, parasites and their control
- Training notes on vaccinations in indigenous chicken
- Training notes on safe handling of veterinary drugs and chemicals
- Vaccination guidelines
- Infectious disease factsheets (Marek's, NCD, IBD)

### 11.8.2 References

1. KARI (2006) Indigenous chicken production manual. KARI Technical Note No. 18, February 2006 [https://www.kalro.org/fileadmin/publications/tech\\_notes/TecNote18\\_20060810.pdf](https://www.kalro.org/fileadmin/publications/tech_notes/TecNote18_20060810.pdf)
2. CTA (2007) Improved Practices in Rearing Indigenous Chickens. *CTA Practical Guide Series, No. 4*



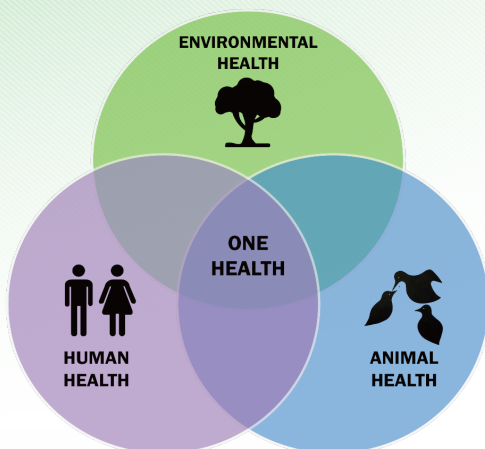


## MODULE 12: ONE HEALTH APPROACH FOR SUSTAINABLE INDIGENOUS CHICKEN PRODUCTION

### 12.1 Introduction to the Module

One Health is an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals and ecosystems. It recognizes the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and inter-dependent. The approach mobilizes multiple sectors, disciplines and communities to improve human, animal and environmental health outcomes. Climate change has increased health security risks of public health importance such as the infectious disease outbreaks that have increased significantly since 1980 and highlighting the need for pandemic preparedness and national plans for resilience.

Specific challenges requiring redress through OH include zoonoses, AMU/AMR, waste management, biosafety and biosecurity concerns. The poultry production has suffered from the zoonotic threat of the Highly Pathogenic Avian Influenza (HPAI) that's transmitted from wild birds. Food safety concerns post-harvest include zoonotic pathogens such as resistant bacteria and mycotoxins. Of greatest concern now is the AMR associated with intensive poultry production and low welfare standards. This module is designed for use in training facilitators on One Health approach, to ensure management of these challenges. This calls for the understanding of the OH components to address and support sustainable poultry (IC) systems for a healthy nation.



**Figure 1: Health Triad (a group of three related things)**

## 12.2 Module Learning Outcomes

By the end of the module, the following outcomes should be achieved:

1. One Health concept explained and appreciated.
2. Components of the OH triad identified.
3. Role of the different collaborators described.
4. Appropriate OH practices for increased IC productivity and healthy ecosystem outlined and explained.
5. Zoonoses affecting IC described and explained.

## 12.3 Module Target Group

This module targets agricultural extension service providers based at sub county and ward level. It will also be used by private extension service providers.

## 12.4 Module Users

This module is intended for use by master trainers who are members of the Core Team of Trainers (CTT) and Lead farmers. The facilitator using this module should familiarize themselves with the participants' handouts or training materials.

## 12.5 Module Duration

The Module is estimated to take **2 hours**.



## 12.6 Module Summary

One Health Approach In Indigenous Chicken Production			
Sessions	Training Methods	Training Materials	Time
12.6.1 Introduction to the module and levelling of expectations	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Group discussions</li> <li>• Plenary presentations</li> </ul>	<ul style="list-style-type: none"> <li>• Laptop</li> <li>• Projector</li> <li>• PowerPoint presentation</li> <li>• Flip charts</li> <li>• Felt pens</li> <li>• Sticky notes</li> <li>• Notebooks</li> <li>• Pens</li> <li>• Participants' handouts</li> </ul>	10 minutes
12.6.2 Overview on climate variability and OH outcomes in IC production	<ul style="list-style-type: none"> <li>• Plenary discussions</li> <li>• Plenary presentation</li> </ul>	<ul style="list-style-type: none"> <li>• Laptop</li> <li>• Projector</li> <li>• PowerPoint presentation</li> <li>• Flip charts</li> <li>• Felt pens</li> <li>• Participants' handouts</li> </ul>	20 minutes
12.6.3. Climate related zoonotic diseases affecting IC	<ul style="list-style-type: none"> <li>• Plenary Presentation</li> <li>• Videos</li> </ul>	<ul style="list-style-type: none"> <li>• Laptop</li> <li>• Projector</li> <li>• PowerPoint presentation</li> <li>• Flip charts</li> <li>• Felt pens</li> <li>• Participants' 'handouts</li> </ul>	25 minutes
12.6.4. AMU/AMR	<ul style="list-style-type: none"> <li>• Plenary Presentation</li> </ul>	<ul style="list-style-type: none"> <li>• Laptop</li> <li>• Projector</li> <li>• PowerPoint presentation</li> <li>• Flip charts</li> <li>• Felt pens</li> <li>• Participants' handouts</li> </ul>	25 minutes

12.6.5 Environmental health	<ul style="list-style-type: none"> <li>• Plenary Presentation</li> <li>• Videos</li> <li>• Plenary discussions</li> </ul>	<ul style="list-style-type: none"> <li>• Laptop</li> <li>• Projector</li> <li>• PowerPoint presentation</li> <li>• Flip charts</li> <li>• Felt pens</li> <li>• Participants' handouts</li> </ul>	25 minutes
12.6.6 Module review	<ul style="list-style-type: none"> <li>• Participants' questions and comments</li> <li>• Facilitator's summary</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• Laptop</li> <li>• Projector</li> <li>• Felt pens</li> </ul>	15 minutes
<b>TOTAL</b>			<b>2 hours</b>

## 12.7 Facilitator Guidelines

12.7.1 Introduction and Levelling Expectations (10 minutes)	Session Guide
<p><i>(The facilitator welcomes participants to the One Health module and introduces self by stating his/her profile and experience of working with farmers and focus on One Health space).</i></p> <p><b>Trainees' expectation</b>  <i>The facilitator organizes the trainees into groups to come up with their expectations</i></p> <p><b>Module Objectives</b>  <i>The facilitator presents the module objectives.</i></p> <p>By the end of the training module the trainee should be able to:</p> <ul style="list-style-type: none"> <li>• Explain One Health concept.</li> <li>• Identify the components of the OH triad</li> <li>• Describe the role of the different collaborators</li> <li>• Outline and explain appropriate OH practices for increased IC productivity and healthy ecosystem</li> <li>• Explain Zoonoses affecting IC.</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Distribute participants' handouts</li> <li>• Refer to participants' expectations on a flip chart to track progress</li> </ul>
12.7.2 Overview on climate variability and OH outcomes (20 minutes)	Session Guide
<b><i>(Discussion On Participants' Experience:</i></b>	
<p><i>(The facilitator will guide the participants in relating climate variability and OH outcomes that negatively impact health and IC production. Participants will share their experiences on OH aspects they are familiar with)</i></p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussion</li> </ul>



<p><b>Plenary Presentation and discussion</b></p> <p><i>List the names of diseases and pests/parasites as they are mentioned and their occurrence in relation to seasons</i></p> <ul style="list-style-type: none"> <li>• Basic terminologies used in the module (One Health, Human Health, Animal Health, Environmental Health, OH Triad)</li> <li>• Explain climate change and relationship with zoonotic diseases</li> <li>• Proposed adaptation measures</li> </ul> <p><i>In plenary discussion ask the participants to relate climate variability and zoonotic diseases</i></p>	
<p><b>12.7.3 Climate related zoonotic diseases affecting Indigenous Chicken (25 minutes)</b></p>	<p><b>Session Guide</b></p>
<p><i>(The facilitator will guide the participants in identifying climate related zoonotic diseases affecting IC and their management options).</i></p> <p><b>Plenary presentation</b></p> <ul style="list-style-type: none"> <li>• Zoonotic diseases</li> <li>• Emerging and re-emerging Infectious Diseases (EID/ REID)</li> <li>• Pandemic preparedness</li> <li>• Biosafety &amp; Biosecurity</li> <li>• Safety of poultry products</li> </ul> <p><i>In plenary discussion ask them to share the farmers' experience in managing the zoonotic diseases – HPAI, poultry meat spoilage</i></p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Participants' handouts</li> <li>• Group discussion</li> <li>• Plenary discussion</li> </ul>
<p><b>12.7.4 Antimicrobial use and antimicrobial resistance (AMU/AMR) (25 minutes)</b></p>	<p><b>Session Guide</b></p>
<p><i>(The facilitator will guide the participants in identifying climate related challenges in AMR, treatment failure and preventive options).</i></p> <p><b>Plenary presentation</b></p> <ul style="list-style-type: none"> <li>• Indiscriminate antimicrobial use</li> <li>• Antimicrobial resistance</li> <li>• WHO classification of antibiotics – Critically important antibiotics</li> <li>• Problem of superbugs</li> <li>• Drug residues in animal source foods</li> <li>• Intensive production and animal welfare as drivers of AMR</li> </ul> <p><i>In plenary discussion ask them to share the farmers' experiences with antimicrobials and treatment failure – antibiotics, acaricides, pesticides etc.</i></p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Participants' handouts</li> <li>• Plenary discussion</li> </ul>

<b>12.7.5 Environmental health (25 minutes )</b> <i>(The facilitator will guide the participants in identifying climate related adverse environmental health impacts)</i> <b>Plenary Presentation</b> Environmental health <ul style="list-style-type: none"> <li>• Deforestation and Land degradation</li> <li>• Waste management (including manure disposal)</li> <li>• GHG emissions</li> <li>• Carbon sink</li> </ul> <i>In plenary discussion ask them to share the farmers' experience in managing their production environment</i>	<b>Session Guide</b> <ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussion</li> <li>• Participants' handouts</li> </ul>
<b>12.7.6 Module review (10 minutes )</b> <i>(The facilitator lets the trainees in reviewing the module)</i> Summarize the main points of the training together with trainees. <ul style="list-style-type: none"> <li>• Discuss with trainees about new lessons learnt.</li> <li>• Address issues that need clarification.</li> </ul>	<b>Session Guide</b> <ul style="list-style-type: none"> <li>• Participants handouts</li> <li>• Summarize the main points from the module on a flip chart and display.</li> </ul>

## 12.8 Reference materials

### 12.8.1 Participants' handouts

- Training notes on One Health approach in indigenous chicken production

### 12.8.2 References

1. One Health Joint Plan of Action, 2022–2026. Working together for the health of humans, animals, plants and the environment. Rome: FAO; UNEP; WHO; World Organisation for Animal Health (WOAH) (founded as OIE). 2022.





## MODULE 13: WASTE MANAGEMENT IN INDIGENOUS CHICKEN PRODUCTION

### 13.1 Introduction to the module

Waste management in indigenous chicken production is important for several reasons and the most important ones are:

- a) Reduce disease risk on the farm –good chicken management and biosecurity practices reduces the risk of pest and disease introduction and multiplication on the farm. Avoid wet bedding and manage your manure well
- b) Reduce the risk of contaminating eggs and meat
- c) Reduce the risk of environmental pollution and loss of nutrients.

This module is designed for the purpose of exposing facilitators to the management of wastes from indigenous chicken. The waste can be used for livestock feeding, crop production and biogas production.

### 13.2 Learning Outcomes

By the end of the module the following should be achieved:

- 1. The importance of managing wastes from chicken production systems described
- 2. Management of chicken manure, feathers and dead birds in a circular economy explained
- 3. Management and application of chicken manure on crops described

### 13.3 Module Target Group and Categories

This module targets agricultural extension officers, extension service providers based at the county level and lead farmers.

### 13.4 Module Duration

The Module is estimated to take one hour.

### 13.5 Module Users

The module is intended for use by master trainers who are members of the core team of trainers (CTT), agripreneurs and lead farmers in indigenous chicken value chain target counties. The facilitator using this module should thoroughly familiarize him/herself with the participant's handouts (training materials) and training reference materials.

### 13.6 Module Summary

Waste Management in Indigenous Chicken Production			
Sessions	Training Methods	Training Materials	Time
13.6.1 Introduction, module outcomes and expectations	<ul style="list-style-type: none"><li>• Plenary presentation</li><li>• Plenary discussion</li></ul>	<ul style="list-style-type: none"><li>• PowerPoint Presentation</li><li>• Projector</li><li>• Laptop</li><li>• Video</li><li>• Flip charts</li><li>• Felt pens</li></ul>	5 minutes
13.6.2 Type and impact of wastes in indigenous chicken production	<ul style="list-style-type: none"><li>• Plenary discussion</li><li>• Plenary Presentation</li></ul>	<ul style="list-style-type: none"><li>• PowerPoint Presentation</li><li>• Projector</li><li>• Laptop</li><li>• Video</li></ul>	10 minutes
13.6.3 Forms of waste management	<ul style="list-style-type: none"><li>• Plenary presentation</li><li>• Plenary discussion</li><li>• Group exercise</li><li>• Practical Demonstration</li></ul>	<ul style="list-style-type: none"><li>• PowerPoint presentation</li><li>• Flip charts</li><li>• Felt pens</li><li>• Video</li></ul>	40 minutes
13.6.4 Module Review	<ul style="list-style-type: none"><li>• Plenary Presentation</li><li>• Plenary discussion</li></ul>	<ul style="list-style-type: none"><li>• Evaluation Form</li></ul>	5 minutes
<b>TOTAL</b>			<b>1 hour</b>



## 13.7 Facilitators Guidelines

Waste Management in Indigenous Chicken Production	
13.7.1 Introduction, outcomes and expectations (5 minutes)	Session Guide
<p><i>The facilitator introduces the module and invites trainees to introduce themselves and state their expectations. The facilitator presents module objectives.</i></p> <p><b>Module objectives</b></p> <p>By the end of the module participants should be able to:</p> <ul style="list-style-type: none"> <li>• Explain the importance of waste management in chicken production</li> <li>• Identify and classify wastes from a chicken enterprise</li> <li>• Demonstrate management of wastes from a chicken enterprise.</li> </ul>	<ul style="list-style-type: none"> <li>• Summarize participants “expectations” using cards or any appropriate method.</li> <li>• PowerPoint presentation</li> <li>• Distribute training notes and handouts at the end of the module</li> </ul>
13.7.2 Type and Impact of Improper waste management (10 minutes)	Session guide
<p><b>Plenary Presentation</b></p> <p><i>The facilitator makes a presentation on waste generation in chicken production systems and socio-economic impact.</i></p> <p><b>Group exercise</b></p> <p><i>The trainees break into groups identify types of wastes associated with indigenous chicken production and discuss the importance/benefits of management of the generated waste.</i></p> <p><b>Plenary discussion and group work</b></p> <p><i>The trainees discuss the various points raised and any issues that may arise. Any questions are also answered during this session.</i></p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Video</li> <li>• Plenary discussion</li> </ul>
13.7.3 Chicken waste management strategies (30 minutes)	Session guide
<p><i>The facilitator leads a brainstorming session on the various strategies of managing chicken waste. This is aimed at gauging the participants level of knowledge in waste management and helps the facilitator during his/her PowerPoint presentation</i></p> <ul style="list-style-type: none"> <li>• Brainstorming on waste management strategies</li> </ul> <p><b>Plenary presentation</b></p> <ul style="list-style-type: none"> <li>• Specific waste management strategies</li> </ul>	<ul style="list-style-type: none"> <li>• Brainstorming sessions and discussion</li> <li>• PowerPoint presentation</li> <li>• Video</li> <li>• Plenary discussion</li> </ul>

<ul style="list-style-type: none"> <li>Advantages and disadvantages of each waste management strategy</li> </ul> <p><b>Plenary discussion</b></p> <p><i>The participants ask questions on the presentation, which are answered by the facilitator.</i></p>	
<b>13.7.4 Potential uses of Waste from chicken production enterprise (10 minutes)</b>	<b>Session guide</b>
<p><i>The facilitator leads the participants in forming groups to discuss the potential uses of chicken waste. This will later be discussed in plenary with all the groups participating. If the group work is not conclusive, the facilitator can make PowerPoint presentations on the module. If the discussions are conclusive then the facilitator can make a summary of the sub-module and allow any clarifications from the participants.</i></p> <p><b>Plenary presentation and discussion</b></p> <p>Potential uses of chicken wastes</p> <ul style="list-style-type: none"> <li>Feathers</li> <li>Manure <ul style="list-style-type: none"> <li>a) Animal feed</li> <li>a) Bio-fertilizer</li> </ul> </li> <li>Biogas</li> </ul>	<ul style="list-style-type: none"> <li>Group work</li> <li>PowerPoint presentation</li> <li>Videos</li> <li>Plenary discussion</li> </ul>
<b>13.7.5 Module review (5 minutes)</b>	<b>Session guide</b>
<p><i>The facilitator leads the participants in reviewing the module in plenary.</i></p> <p>Summarize and review the main points of the training with the participants about waste management in chicken production systems</p> <ul style="list-style-type: none"> <li>What are the new lessons learnt from the module?</li> <li>What are some of the problems and issues that trainees have become more aware of in the module?</li> <li>What is the main take-home message?</li> </ul>	<p>Recap of the key take-home points using any of the following participatory methods:</p> <ul style="list-style-type: none"> <li>Q &amp; A session</li> <li>Discussions</li> <li>Questionnaires</li> <li>Any other</li> </ul>

## 13.8 Reference materials

### 13.8.1 Participants' handouts

- Training notes on poultry waste for dairy cattle feed
- Training notes on dairy cattle feed formulation



### 13.8.2 References

1. KARI (2012) Indigenous chicken Training manual. [https://www.kalro.org/csapp/images/SPADE-CLEP-manual\\_July-23-small1.pdf](https://www.kalro.org/csapp/images/SPADE-CLEP-manual_July-23-small1.pdf)



## MODULE 14: VICES IN CHICKEN PRODUCTION

### 14.1 Introduction to the Module

Stress during production leads to vices such as cannibalism, egg eating, toe pecking and feather pecking among others. Vices are difficult to eliminate once entrenched in a flock. It is important to detect and manage vices as soon as they start to avoid their negative effects on production and carcass quality. The main causes of vices in production include; inadequate chicken space, excessive lighting and heating; inadequate feeding and drinking space; unbalanced diets; mixing of chicken of different ages, colour and breed of chicken and prolapse. This module specifies knowledge and skills required to identify and manage stress in chicken production.

### 14.2 Module Learning Outcomes

By the end of the module the following should be achieved:

1. Chicken vices described.
2. Identification and monitoring good and bad behaviour in chicken recounted.
3. Good management practices in production outlined and explained
4. Management of stress/vices in chicken demonstrated and explained

### 14.3 Module Target Group

This module targets service providers, public and private extension agents and lead farmers.

### 14.4 Module Users

This module is intended for use by master trainers who are members of the Core Team of Trainers (CTT). The module user should thoroughly familiarize themselves with the participant's handouts and training reference materials.



## 14.5 Module Duration

The Module is estimated to take one hour.

## 14.6 Module Summary

Vices in Chicken production			
Sessions	Training methods	Training Materials	Time
14.6.1 Module learning out-comes and expectations	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Group discussions</li> <li>• Plenary presentations</li> </ul>	<ul style="list-style-type: none"> <li>• Laptop</li> <li>• Projector</li> <li>• PowerPoint presentation</li> <li>• Flip charts</li> <li>• Participants' handouts</li> </ul>	5 minutes
14.6.2. Define chicken vices and their causes in chicken production	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Group discussions</li> <li>• Plenary presentations</li> </ul>	<ul style="list-style-type: none"> <li>• Laptop</li> <li>• Projector</li> <li>• PowerPoint presentation</li> <li>• Flip charts</li> <li>• Participants' handouts</li> </ul>	10 minutes
14.6.3. Identifying and managing important chicken vices	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Group discussions</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Laptop</li> <li>• Projector</li> <li>• PowerPoint presentation</li> <li>• Flip charts</li> <li>• Participants' handouts</li> </ul>	10 minutes
14.6.4. Monitoring good and bad behaviour in Chicken	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Group discussions</li> <li>• Plenary discussions</li> </ul>	<ul style="list-style-type: none"> <li>• Laptop</li> <li>• Projector</li> <li>• PowerPoint presentation</li> <li>• Flip charts</li> <li>• Participants' handouts</li> </ul>	10 minutes
14.6.5 Good management practices in indigenous chicken production	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Group discussions</li> <li>• Plenary discussions</li> </ul>	<ul style="list-style-type: none"> <li>• Laptop</li> <li>• Projector</li> <li>• PowerPoint presentation</li> <li>• Flip charts</li> <li>• Participants' handouts</li> </ul>	10 minutes

14.6.6 Managing stress/vices in chicken	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Group discussions</li> <li>• Plenary discussions</li> </ul>	<ul style="list-style-type: none"> <li>• Laptop</li> <li>• Projector</li> <li>• PowerPoint presentation</li> <li>• Flip charts</li> <li>• Participants' handouts</li> </ul>	15 minutes
<b>TOTAL</b>			<b>1 hour</b>

## 14.7 Facilitator's Guidelines

<b>Vices in Chicken production</b>	
<b>14.7.1. Introduction, objectives and expectations (5 minutes)</b>	<b>Session Guide</b>
<p><b>Introduction</b>  <i>(The facilitator introduces the module and invites trainees to introduce themselves and state their expectations. The facilitator presents module objectives)</i></p> <p><b>Module objectives</b>  <u>By the end of the module, the trainee should be able to:</u></p> <ul style="list-style-type: none"> <li>• Describe chicken vices.</li> <li>• Identify and monitor good and bad behaviour in chicken.</li> <li>• Outline Explain good management practices in production</li> <li>• Explain managing of stress/vices in chicken</li> </ul>	<ul style="list-style-type: none"> <li>• Summarize participants "expectations" using cards</li> <li>• Power point presentation</li> <li>• Distribute handouts to participants at the end of the module</li> </ul>
<b>14.7.2. Define indigenous chicken vices and their causes in chicken production (10 minutes)</b>	<b>Session Guide</b>
<p><b>Plenary presentation and discussion</b>  <i>The facilitator defines chicken vices and their effects on production and productivity of indigenous chicken</i></p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Distribute participants' handouts</li> <li>• Visual aids</li> </ul>
<b>14.7.3. Knowledge and skills in identifying and managing important indigenous chicken vices (10 minutes)</b>	<b>Session Guide</b>
<p><b>Plenary presentation and discussion</b>  <i>The facilitator creates awareness, knowledge and skills on how to look out for bad vices in a flock</i></p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussion</li> <li>• Distribute participants' handouts</li> <li>• Visual aids</li> </ul>



<b>14.7.4. Monitoring good and bad behaviour in indigenous Chicken (10 minutes)</b>	<b>Session Guide</b>
<b>Plenary presentation and discussion</b> <i>The facilitator imparts skills on when to look out for good and bad vices during the production cycle</i>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussion</li> <li>• Distribute participants' handouts</li> <li>• Visual aids</li> </ul>
<b>14.7.5. Best management practices indigenous chicken production (30 minutes)</b>	<b>Session Guide</b>
<b>Plenary presentation and discussion</b> <i>The facilitator leads participants in discussing management practices that reduce bad vices in a flock.</i>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussion</li> <li>• Distribute participants' handouts</li> <li>• Visual aids</li> </ul>
<b>14.7.6. Practical skills for managing stress/vices in chicken (15 minutes)</b>	
<b>Practical demonstration</b> <ul style="list-style-type: none"> <li>• Practical demonstration of managing bad vices in chicken e.g. Debeaking chicken</li> <li>• Issues of animal welfare related to managing vices</li> </ul>	<ul style="list-style-type: none"> <li>• Practical group demonstration</li> <li>• Discussion.</li> </ul>

## 14.8 Reference Materials

### 14.8.1 Participants' handouts

- Training notes on vices in Chicken production

### 14.8.2 References

1. Alaru P.A.O., Wangui G., Ouko V.O. & Miano D (2016) Indigenous Chicken Biosecurity
2. KARI (2006) Indigenous chicken production manual. KARI Technical Note No. 18, February 2006 [https://www.kalro.org/fileadmin/publications/tech\\_notes/TecNote18\\_20060810.pdf](https://www.kalro.org/fileadmin/publications/tech_notes/TecNote18_20060810.pdf)



## MODULE 15: NUTRITIONAL VALUE OF CHICKEN MEAT AND EGGS

### 5.1 Introduction to the module

Chicken eggs and meat are valuable sources of nutrition, playing a crucial role in enhancing food and nutritional security. Eggs are an excellent source of high-quality protein, containing all essential amino acids required by the human body. They are also rich in vitamins such as B<sub>12</sub>, riboflavin, and selenium which contribute to the overall well-being and proper functioning of the body. Additionally, eggs are a good source of choline, which is essential for brain health and development. On the other hand, chicken meat provides not only high-quality protein but also essential nutrients like iron, zinc, and B vitamins, including niacin and vitamin B6. These nutrients are vital for maintaining energy levels, supporting the immune system, and promoting healthy metabolism. The accessibility and affordability of chicken eggs and meat make them important contributors to food security, providing a cost-effective and nutritious dietary option for the population. Their versatility in cooking makes them an integral part of diverse diets, addressing nutritional needs and helping combat malnutrition on a global scale. This module introduces participants to the nutritional benefits derived from consuming chicken meat and eggs and the influence on Kenyans' food and nutrition security.

### 15.2 Module Learning Outcomes

By the end of the module the following should be achieved:

1. Nutrition composition of chicken meat and eggs explained
2. Food and nutrition security status in Kenya and the role of indigenous chicken in ensuring food and nutrition security described
3. Nutrition importance of chicken meat and eggs and their health benefits explained



4. Diversification and complimentary foods to chicken meat and eggs identified and explained
5. Making value added products and product development of chicken meat and eggs demonstrated and explained

### 15.3 Module target group

This module is intended for agricultural extension service providers, nutritionists, community health workers, and agripreneurs. It is also advantageous for private extension service providers that work directly with farmer cooperatives at the grassroots level. This information will also be useful to meat and egg product processors.

### 15.4 Module users

This module is intended for use by Master Trainers who are members of the Core Team of Trainers (CTT), Lead Farmers, nutritionists /food scientists, community health workers and agripreneurs in the chicken value chain. The trainers using this module should thoroughly familiarize themselves with the participants' Handouts (training materials).

### 15.5 Module duration

The module is estimated to take 2 hours and 30 minutes

### 15.6 Module summary

Module 15.0 Nutritional value of chicken meat and eggs			
Sessions	Training methods	Training materials	Time
15.6.1 Introduction to the module objectives and Expectations	<ul style="list-style-type: none"> <li>Participants introduction</li> <li>Participants expectations</li> <li>Group exercise</li> </ul>	<ul style="list-style-type: none"> <li>Projector</li> <li>Laptop</li> <li>Flip charts</li> </ul>	10 minutes
15.6.2 Nutrition composition of chicken meat and eggs	<ul style="list-style-type: none"> <li>PowerPoint presentation</li> <li>Group discussions</li> </ul>	<ul style="list-style-type: none"> <li>Flip charts</li> <li>Marker pens</li> <li>Projector</li> <li>Laptop</li> </ul>	10 minutes
15.6.3 The role of chicken products in food and nutrition security	<ul style="list-style-type: none"> <li>Power point presentation</li> <li>Group discussions</li> <li>Plenary presentation</li> </ul>	<ul style="list-style-type: none"> <li>Projector</li> <li>Laptop</li> <li>Flip charts</li> <li>Marker pens</li> <li>Leaflets</li> </ul>	20 minutes

15.6.4 Nutritional importance of chicken meat and eggs and its health benefits	<ul style="list-style-type: none"> <li>• Power point presentation</li> <li>• Group exercise</li> <li>• Plenary presentation</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• Felt pens</li> <li>• Projector</li> <li>• Laptop</li> </ul>	20 minutes
15.6.5 Explain role of chicken meat and eggs products in dietary diversification and complementary feeding to chicken meat.	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Group exercise</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Laptop</li> <li>• Flip charts</li> <li>• Felt pen</li> <li>• Pictorials</li> </ul>	20 minutes
15.6.6 Nutrition based Value addition and product development of chicken meat and eggs	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Practical demonstrations</li> <li>• Sensory evaluation</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Laptop</li> <li>• Participants' handouts</li> <li>• Pictorials</li> <li>• Assorted value added cooking equipment's and ingredients</li> <li>• Sensory evaluation forms</li> </ul>	1 hour
15.6.7 Module review	<ul style="list-style-type: none"> <li>• Plenary presentations</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• Projector</li> <li>• Laptop</li> <li>• PowerPoint presentation</li> <li>• Module evaluation forms</li> </ul>	10 minutes
<b>Total duration</b>			<b>2 hours 30 minutes</b>



## 15.7 Facilitator's guidelines

Module 15 Nutritional value of chicken meat and eggs	
15.7.1 Introduction and climate setting (10 minutes)	Session guide
<p><i>(The trainer introduces the participants to the module on nutrition of chicken meat and eggs)</i></p> <p><b>Participants expectations</b></p> <ul style="list-style-type: none"> <li>The facilitator organizes participants into groups to articulate and document their expectations.</li> </ul> <p><b>Module objectives</b></p> <p><i>(The trainer presents module objectives )</i></p> <p>By the end of the module training, the trainee should be able to:</p> <ul style="list-style-type: none"> <li>Explain the nutrition composition of chicken meat and eggs</li> <li>Describe food and nutrition security; understand the food and nutrition security status in Kenya and the role of indigenous chicken in ensuring food and nutrition security.</li> <li>Explain the nutrition importance of chicken meat and eggs and their health benefits</li> <li>Identify and explain diversification and complimentary foods to chicken meat and eggs</li> <li>Demonstrate and explain how to make value added products and product development of chicken meat and eggs.</li> </ul>	<ul style="list-style-type: none"> <li>Participants' handouts</li> <li>PowerPoint presentation</li> <li>Summarize the trainees expectations and display on the flip chart</li> </ul>
15.7.2 Nutrition composition of indigenous chicken meat and eggs (10 minutes)	
<p><i>(The facilitator leads the trainees in discussing the known nutrition aspects of chicken meat and eggs and do a plenary presentation on the nutrition composition of the products.</i></p> <p><b>Group exercise</b></p> <ul style="list-style-type: none"> <li>Nutrition awareness of chicken meat and eggs</li> </ul> <p><b>Plenary presentation</b></p> <p>Documented nutrition composition of meat and eggs based on both whole and skinless chicken meat, whole eggs, egg white and egg yolk.</p>	<ul style="list-style-type: none"> <li>Group exercise</li> <li>PowerPoint presentation</li> <li>Plenary discussion</li> </ul>

<b>15.7.3 The role of chicken in ensuring improved nutrition status (20 minutes)</b>	
<p><i>(The facilitator defines food and nutrition security, explain food security status in terms of malnutrition and outline the role of chicken meat and eggs in ensuring improved nutritional status thus ensuring food and nutrition security)</i></p> <p><b>Plenary presentations</b></p> <ul style="list-style-type: none"> <li>• Define Food and nutrition security</li> <li>• The current food security status in Kenya</li> <li>• Role of indigenous chicken in ensuring food security in Kenya</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary presentation</li> <li>• Participants' handouts</li> </ul>
<b>15.7.4 Nutritional importance of meat and eggs and its health benefits (20 minutes)</b>	
<p><b>Group exercise</b></p> <p><i>(The facilitators will divide the trainees into groups to discuss nutrition importance of chicken at different stages in lifetime)</i></p> <p><b>Plenary presentation</b></p> <p><i>(The facilitators present the nutrition importance of meat and eggs and its health benefits among people with special conditions like people living with HIV/AIDS, diabetes and hypertensive persons and in weaning children)</i></p> <ul style="list-style-type: none"> <li>• Nutrition importance of meat and eggs and its benefits to people with special conditions</li> <li>• Nutrition importance of meat and eggs and its benefits throughout the life cycle</li> </ul>	<ul style="list-style-type: none"> <li>• Participants' handouts</li> <li>• PowerPoint presentation</li> <li>• Group exercise</li> </ul>
<b>15.7.5 Role of meat and eggs Dietary diversification and complimentary feeding (20 minutes)</b>	
<p><i>(The facilitator will define WHO dietary diversification and recommended complimentary feeding practice. Later on lead the discussion on types of foods that can be eaten with meat, eggs and finally define portion size and servings and do demonstration of each in ensuring healthy living)</i></p> <p><b>Plenary presentation</b></p> <ul style="list-style-type: none"> <li>• Defining dietary diversification and complementary feeding (local nutrient dense foods)</li> </ul> <p><b>Group exercise</b></p> <ul style="list-style-type: none"> <li>• Group discuss on types of food eaten with chicken (My plate, SHARP diets, Balanced diets and DASH diets)</li> </ul> <p><b>Plenary presentation</b></p> <p>Portion size and servings for different groups</p>	<ul style="list-style-type: none"> <li>• Participants' handouts</li> <li>• PowerPoint presentation</li> <li>• Group exercise</li> </ul>



### 15.7.6 Nutrition based Value addition and product development of chicken (1 hours)

<p><b>Plenary presentation</b>  <i>(The facilitator will define value addition and product development and later assemble Assorted value addition equipment's and ingredients and guide the group through cooking demonstration and sensory evaluation)</i></p> <ul style="list-style-type: none"> <li>• Meaning of value addition and product development in relation to nutrition</li> <li>• Effect of value addition in nutritional composition of chicken meat and eggs</li> </ul> <p><b>Group exercise</b></p> <ul style="list-style-type: none"> <li>• Requirements for value addition of chicken meat and eggs</li> <li>• Practices that reduce aflatoxin and salmonella in chicken meat and eggs</li> <li>• Chicken meat and eggs-based value addition cooking demonstration and sensory evaluation</li> </ul>	<ul style="list-style-type: none"> <li>• Participants' handouts</li> <li>• PowerPoint presentation</li> <li>• Group exercise</li> <li>• Recipes</li> <li>• Pictorials</li> <li>• Sensory evaluation forms</li> <li>• Assorted value addition equipment's and ingredients</li> </ul>
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### 15.7.7 Module Review (10 minutes)

<p><b>Group exercise</b>  <i>(The facilitator guides a group activity to review the participants' expectations and conduct a question-and-answer session based on their queries).</i></p> <ul style="list-style-type: none"> <li>• Assess participants' expectations to determine if they were fulfilled.</li> <li>• Identify new insights gained from the module.</li> <li>• Address any questions related to the nutrition of chicken meat and eggs.</li> </ul>	<ul style="list-style-type: none"> <li>• Summary of the main points from the module</li> </ul>
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## 15.8 Reference Materials

### 15.8.1 Participants' handouts

- Training notes on nutritional value of chicken meat and eggs.

### 15.8.2 References

1. FAO (2022). The state of food security and nutrition in the world.
2. IPC (2022) Integrated food security Phase Classification report. (2022). IPC Acute Malnutrition Scale.
3. WHO (2023). Infant and young child feeding. <https://www.who.int/news-room/fact-sheets/detail/infant-and-young-child-feeding>.

4. Bordoni, Alessandra (2017). Poultry Quality Evaluation Poultry Meat Nutritive Value and Human Health. 279–290. doi:10.1016/B978-0-08-100763-1.00011-8.





## MODULE 16: VALUE ADDITION OF CHICKEN MEAT AND EGG PRODUCTS

### 16.1 Introduction to the Module

Value addition aims at seizing opportunities offered by the market. It involves improving the quality of products, enhancing their value and in return better income is realised. Processing and value addition comprises several processes, including transportation and hygienic handling, processing using different value addition techniques and recipes, maintenance of good quality chicken products; packaging, branding and certification of chicken products and preparation and storage of products safely for an extended shelf life. This module specifies the training competencies required for chicken processing and value addition. This is necessary to refresh awareness on knowledge and skills and available approaches, technologies and infrastructural resources that can be adapted to make chicken enterprise more market oriented, competitive and profitable along the entire value chain.

### 16.2 Module Learning Outcomes

By the end of the module, the following outcomes should be achieved:

1. Chicken product (eggs and meat) handling and hygiene requirements outlined
2. Basic principles of chicken production processing and preservation recounted.
3. Benefits and factors to consider in chicken product value addition outlined
4. Chicken products value-addition methods and recipes demonstrated.
5. Quality and safety of value-added products explained.
6. Packaging and branding of chicken products demonstrated

### 16.3 Module Target Group

This module targets service providers, lead farmers, hoteliers, butchers, public and private extension agents.

### 16.4 Module Users

This module is intended for use by master trainers who are members of the Core Team of Trainers (CTT). The module user should thoroughly familiarize themselves with the participant's handouts and training reference materials.

### 16.5 Module Duration

The Module is estimated to take **1 hour 30 minutes**.

### 16.6 Module Summary

Sessions	Training methods	Training materials	Time
16.6.1 Module learning outcomes and expectations	<ul style="list-style-type: none"><li>• Personal introductions</li><li>• Power-point presentation</li></ul>	<ul style="list-style-type: none"><li>• Flip charts</li><li>• Felt pens</li><li>• Projector</li></ul>	5 minutes
16.6.2. Chicken product handling and hygiene requirements	<ul style="list-style-type: none"><li>• Brainstorming</li><li>• Plenary discussions</li></ul>	<ul style="list-style-type: none"><li>• Flip charts</li><li>• Felt pens</li><li>• Participants' handouts</li></ul>	10 minutes
16.6.3. Basic principles of chicken production processing and preservation	<ul style="list-style-type: none"><li>• Audio visuals</li><li>• Demonstrations/ Practical</li><li>• Group discussions</li></ul>	<ul style="list-style-type: none"><li>• Flip charts</li><li>• Felt pens</li><li>• Projector</li><li>• Participants' handouts</li></ul>	5 minutes
16.6.4. Benefits and factors to consider in chicken product value addition	<ul style="list-style-type: none"><li>• Plenary discussions</li><li>• Plenary presentation</li></ul>	<ul style="list-style-type: none"><li>• Flip charts</li><li>• Felt pens</li><li>• Participants' handouts</li></ul>	10 minutes
16.6.5 Value-added production methods and recipes	<ul style="list-style-type: none"><li>• Practical demonstrations</li><li>• Group formation</li></ul>	<ul style="list-style-type: none"><li>• Demonstration materials</li><li>• Flip charts</li><li>• Felt pens</li><li>• Participants' handouts</li></ul>	40 minutes



16.6.6. Quality and safety of value-added products	<ul style="list-style-type: none"> <li>• Plenary discussion</li> <li>• Plenary presentation</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• Felt pens</li> <li>• Participants' handouts</li> </ul>	10 minutes
16.6.7 Packaging and branding of chicken products demonstrated	<ul style="list-style-type: none"> <li>• Plenary discussion</li> <li>• Practical demonstrations</li> <li>• Group formation</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstration materials</li> <li>• Flip charts</li> <li>• Felt pens</li> <li>• Participants' handouts</li> </ul>	5 minutes
16.6.8. Module review	<ul style="list-style-type: none"> <li>• Plenary discussion</li> <li>• Plenary presentation</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluation forms</li> <li>• Flip charts</li> <li>• Felt pens</li> </ul>	5 minutes
<b>TOTAL</b>			<b>1 hours 30 minutes</b>

## 16.7 Facilitator's Guidelines

Chicken Product Processing and Value addition	
16.7.1 Introduction, objectives and expectations (5 minutes)	Session Guide
<p><i>(The facilitator introduces the module and invites participants to introduce themselves and state their expectations. The facilitator presents module objectives</i></p> <p><b>Module objectives</b></p> <p>By the end of this module, the trainee should be able to:</p> <ul style="list-style-type: none"> <li>• Outline Chicken product handling and hygiene requirements</li> <li>• Recount basic principles of chicken production processing and preservation</li> <li>• Recount the benefits and factors to consider in chicken product value addition</li> <li>• Recall the recipes and be able to demonstrate the various methods of chicken products value addition.</li> <li>• Explain quality and safety requirements of value-added products Explained quality and safety of value-added products.</li> <li>• Outline packaging and branding of chicken products</li> </ul>	<ul style="list-style-type: none"> <li>• Summarize participants "expectations" using cards or any appropriate method</li> <li>• PowerPoint presentation</li> <li>• Distribute handouts to participants at the end of the module</li> </ul>

16.7.2 Chicken product handling and hygiene requirements (10 minutes)	Session guide
<p><i>(The facilitator explains how to prevent chicken meat and egg contamination for food safety and guides the participants in discussing of the same)</i></p> <p><b>Plenary presentation and discussion</b></p> <p><i>Plenary presentation and discussion on the following:</i></p> <ul style="list-style-type: none"> <li>• Importance of good chicken product handling practices and hygiene requirements for chicken product handlers</li> </ul> <p><b>Product quality aspects</b></p> <ul style="list-style-type: none"> <li>• What chicken meat and egg quality is and its importance</li> <li>• Factors affecting quality at the farm.</li> <li>• Application of good product handling practices on-farms to reduce product contamination</li> </ul> <p><b>How to prevent product contamination</b></p> <ul style="list-style-type: none"> <li>• Temperature control</li> <li>• Display units</li> </ul> <p><b>Sources of food borne diseases</b></p> <ul style="list-style-type: none"> <li>• Food handler</li> <li>• Food/Product</li> <li>• Environment</li> </ul> <p><b>Video Presentation</b></p> <p><i>Facilitator plays video clips on hygiene requirements for chicken products handlers).</i></p>	<ul style="list-style-type: none"> <li>• Q&amp;A sessions</li> <li>• Participants' handouts</li> <li>• Play video related to food hygiene requirements</li> <li>• Plenary presentation</li> <li>• Plenary discussion</li> </ul>
16.7.3 Basic principles of chicken production processing and preservation 5 minutes)	Session guide
<p><b>Plenary presentation</b></p> <p><i>The facilitator presents the following on PowerPoint and flip charts:</i></p> <ul style="list-style-type: none"> <li>• How to assess chicken meat and egg freshness</li> <li>• Factors contributing to spoilage</li> <li>• Stages of spoilage</li> <li>• How to slow down spoilage</li> <li>• Types of Chicken preservation</li> <li>• Smoking</li> <li>• Traditional</li> <li>• Modern</li> <li>• Evisceration</li> <li>• Chilling and freezing</li> <li>• principles for good icing practice</li> <li>• Salting</li> <li>• Types of salting</li> <li>• Canning</li> <li>• Fermentation</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Demonstration/ Practical session</li> <li>• Recipe Book and Brochures</li> <li>• Visual Videos on Farm to Table Technology (FTT)</li> <li>• Distribute handouts to participants</li> </ul>



16.7.4 Benefits and Factors to consider in chicken product value addition (10 minutes)	Session guide
<p><b>Plenary presentation</b>  <i>(The facilitator guides participants on factors to consider in chicken value addition and make a PowerPoint presentation on the following)</i></p> <ul style="list-style-type: none"> <li>• Quality standards</li> <li>• Cost-benefit analysis</li> <li>• Increased product shelf life</li> <li>• Better product prices</li> <li>• The increased product mix in the market</li> <li>• Product quality assurance</li> <li>• Product traceability</li> <li>• Easy and safe commodity handling</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Distribute participants' handouts</li> <li>• Q&amp; A session</li> </ul>
16.7.5 Chicken and egg value-added production methods and recipes (40 minutes)	Session guide
<p><i>The facilitator takes the participants through discussions on product development, practical exercises and other value addition technologies (recipes)</i></p> <p><b>Plenary Discussion</b>  <i>Ask these questions to consider when deciding on value addition.</i></p> <ul style="list-style-type: none"> <li>• Healthy and nutritious</li> <li>• Low in fat</li> <li>• White meat or Organic or free range</li> <li>• What processed chicken meat and egg product are locally available in the markets in your counties?</li> <li>• Do you consume these products regularly?</li> <li>• Which products have interested you?</li> </ul> <p><b>Practical demonstration</b>  Demonstrate preparation process for selected recipes for value addition eggs and chicken meat</p> <ul style="list-style-type: none"> <li>• Meat (dressed chicken, skinless chicken, deboning in chicken, cuts from chicken carcass, grilled chicken)</li> <li>• Eggs (Pasteurized eggs, pickled eggs and egg powder (use existing videos where necessary)</li> <li>• Convenient packaging, easy to cook.</li> </ul>	<ul style="list-style-type: none"> <li>• Distribute handouts to participants</li> <li>• Q&amp;A Session</li> <li>• Practical demonstrations and Practical session</li> </ul>

16.7.6 6. Quality and safety of value-added products (10 minutes)	Session guide
<b>Plenary presentation</b> <i>(The facilitator guides trainees on factors to consider quality and safety standards of value added chicken products and make a PowerPoint presentation)</i> <ul style="list-style-type: none"> <li>Requirements of quality standards and safety in chicken meat and eggs</li> </ul>	<ul style="list-style-type: none"> <li>Distribute handouts to participants</li> <li>Q&amp;A Session</li> <li>PowerPoint presentation</li> </ul>
16.7.6 Packaging and branding of chicken products (5 minutes)	
<i>(The facilitator guides trainees on factors to consider in packaging of value added chicken products and make a PowerPoint presentation)</i> <ul style="list-style-type: none"> <li>Requirements of packaging poultry meat and eggs</li> <li>Types of packaging materials for chicken meat and eggs</li> <li>Appropriate packaging techniques for chicken meat and eggs</li> </ul>	<ul style="list-style-type: none"> <li>Distribute handouts to participants</li> <li>Q&amp;A Session</li> <li>Practical demonstration</li> </ul>
16.7.8 Module review (5 minutes)	Session guide
<i>(The facilitator leads the trainees in reviewing the module)</i> Assess participants' expectations to determine if they were fulfilled. Identify new insights gained from the module. Address any questions related to the nutrition of chicken meat and eggs.	<ul style="list-style-type: none"> <li>Recap of the key take home points using any of the following participatory methods;</li> <li>Discussions</li> <li>Q&amp; A session</li> <li>Questionnaires</li> </ul>

## 16.8 Reference Materials

### 16.8.1 Participants' Handouts

- Participant handout on value addition for indigenous chicken meat and egg

### 16.8.2 References

- KALRO Chicken Manual 2<sup>nd</sup> Edition, [https://www.kalro.org/fileadmin/publications/tech\\_notes/TecNote18\\_20060810.pdf](https://www.kalro.org/fileadmin/publications/tech_notes/TecNote18_20060810.pdf)
- Heinz, G., & Hautzinger, P. (2007). Meat processing technology for small to medium scale producers. RAP Publication (FAO)
- Hui, Y. H. (2010). Handbook of Poultry Science and Technology, Primary processing, (Vol. 1). John Wiley & Sons
- Barbut, S. (2015). The Science of Poultry and Meat Processing.





## MODULE 17: INCUBATION AND HATCHERY MANAGEMENT

### 17.1 Introduction to the Module

Incubation in chicken is the process of the embryonic development in fertile egg to a chick and takes 21 to 23 days. This process can be achieved through a natural method where a hen sits on eggs or through artificial incubation where an incubator is used. In natural incubation, a broody hen is given between 10-15 eggs, depending on her size and mothering ability. The hen provides all the required conditions for the growing embryo such as warmth, humidity, and turning. Overall, hatchability is higher in natural incubation. It can be up to 100% and is usually higher than artificial incubation. Artificial incubation is appropriate for large hatcheries. Incubators mimic the hen in and should be operated by specialized personnel with the aim of achieving maximum hatch from the eggs set. Hatchability in artificial incubation is, on average, 75% and above in well-functioning equipment under good management practices. Many farmers have invested in artificial hatching technologies but lack knowledge on how to optimize the use of incubators.

Hatchery management in chickens encompasses a series of practices and procedures aimed at the effective operation and supervision of a hatchery. These procedures are pivotal for the overall success of chicken production, as they directly impact the quality and productivity of the flock. Implementing efficient management practices can lead to increased hatchability, enhanced bird health, and improved overall production outcomes. The primary objective of hatchery management is to ensure the production of robust chicks with high hatchability rates. Key aspects of hatchery management comprise various activities such as egg selection, incubation, turning of eggs, candling, harvesting, vaccination, and other related management practices. Each of these components contributes to the overall success and health of the chicken flock.

## 17.2 Learning Outcomes

By the end of this module, the following outcomes should be achieved:

1. Proper design and recommended biosecurity features of a hatchery described.
2. Types of artificial incubators and their operational processes identified and explained.
3. Breeder flock management techniques outlined and explained.
4. Hatching egg management, including collection, grading, handling, and storage conditions described and explained.
5. Egg setting, fumigation, incubation, and candling processes outlined and explained
6. Egg transfer, chick harvesting, grading, vaccination, as well as packaging and transportation described.
7. Protocols for hatchery cleaning and effective waste disposal/management identified and described.
8. Trouble shooting failures with egg incubation identified and explained.

## 17.3 Target Group and Categories

This module is designed for county-level public and private extension service providers, cooperative members, agripreneurs, and other leaders within the IC value chain.

## 17.4 Module Users

This module is designed for trainer of trainers (TOT) specializing in indigenous chicken production value chain. These trainers are integral members of the Core Team of Trainers (CTT). It provides an overview of the learning outcomes, the specific trainee audience, a module summary, and accompanying participant handouts. Facilitators utilizing this module should ensure a comprehensive understanding of the provided participant materials.

## 17.5 Module Duration

The anticipated duration for completing the module is 2 hours.

## 17.6 Module Summary

Hatchery Management and Incubation			
Sessions	Training Methods	Training Materials	Time
17.6.1. Introduction, module outcomes and expectations	<ul style="list-style-type: none"><li>• Plenary presentation</li><li>• Plenary discussion</li></ul>	<ul style="list-style-type: none"><li>• Flip charts,</li><li>• Felt pens</li><li>• Projector</li><li>• Laptop</li></ul>	10 minutes



17.6.2. Importance of design, and biosecurity requirements of a hatchery	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• demonstration</li> <li>• Group discussions</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Laptop</li> <li>• Flip charts</li> <li>• Felt pens</li> </ul>	15 minutes
17.6.3 Handling and management of hatching egg <ul style="list-style-type: none"> <li>• Egg carrying trays</li> <li>• Collection and placement of eggs in trays</li> <li>• Egg grading</li> <li>• Egg storage conditions</li> </ul>	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Group discussion</li> <li>• Practical demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Laptop</li> <li>• Flip charts</li> <li>• Felt pens</li> <li>• Hatching eggs for grading</li> <li>• Egg grading chart</li> </ul>	15 minutes
17.6.4 Egg setting and incubation management <ul style="list-style-type: none"> <li>• Egg setting equipment</li> <li>• Egg fumigation</li> <li>• Incubation parameters- Temperature, Humidity, Ventilation, and egg turning.</li> <li>• Egg candling and transfer to the hatcher</li> </ul>	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Group discussions</li> <li>• Practical demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Laptop</li> <li>• Flip charts,</li> <li>• Felt pens</li> <li>• Incubator with setter trays</li> <li>• Hatching eggs</li> <li>• Fumigants</li> <li>• Power for incubation</li> </ul>	15 minutes
17.6.5 Egg hatcher management <ul style="list-style-type: none"> <li>• Hatching parameters</li> <li>• Monitoring and Recording of the Parameters</li> </ul>	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Group discussions</li> <li>• Plenary discussions</li> <li>• Practical demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Laptop</li> <li>• Flip chart</li> <li>• Participants' handouts</li> </ul>	15 minutes

<p>17.6.6 Chick Harvesting and distribution</p> <ul style="list-style-type: none"> <li>• Chick harvesting and grading.</li> <li>• Day old Chick vaccines and vaccination</li> <li>• Chick packaging and dispatch</li> <li>• Veterinary inspections</li> <li>• Hatchery and chick inspection</li> </ul>	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Group discussions</li> <li>• Plenary discussions</li> <li>• Practical demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Laptop</li> <li>• Flip chart</li> <li>• Participants' handouts</li> </ul>	15 minutes
<p>17.6.7 Hatchery cleaning and waste management</p> <ul style="list-style-type: none"> <li>• Cleaning and disinfecting hatchery equipment</li> <li>• Cleaning and disinfecting the hatchery</li> <li>• Types of hatchery wastes</li> <li>• Management of hatchery waste</li> <li>• Waste management certification by NEMA</li> </ul>	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Group discussions</li> <li>• Plenary discussions</li> <li>• Practical demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Laptop</li> <li>• Flip chart</li> <li>• Participants' handouts</li> </ul>	15 minutes
<p>17.6.8 Trouble shooting failures with egg incubation</p>	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Group discussions</li> <li>• Plenary discussions</li> <li>• Practical demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Laptop</li> <li>• Flip chart</li> <li>• Egg incubation Trouble shooting chart</li> <li>• Incubated unhatched eggs</li> </ul>	15 minutes



17.6.9 Module Review	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Plenary discussions</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Laptop</li> <li>• Flip chart</li> </ul>	5 minutes
<b>TOTAL</b>			<b>2 hours</b>

## 17.7 Facilitator's Guidelines

Incubation and Hatchery Management	
17.7.1 Introduction, outcomes, and expectations (10 minutes)	Session Guide
<p><i>The facilitator begins the module by having trainees introduce themselves and share their expectations. Following this introduction, the facilitator presents the module's objectives and sets expectations for the session.</i></p> <p><b>Module objectives</b></p> <p>By the end of the module participants should be able to:</p> <ul style="list-style-type: none"> <li>• Describe proper design and recommended biosecurity features of a hatchery.</li> <li>• Identify and explain the types of artificial incubators and their operational processes</li> <li>• Explain breeder flock management techniques.</li> <li>• Describe and explain hatching egg management, including collection, grading, handling, and storage conditions.</li> <li>• Outline and explain the egg setting, fumigation, incubation, and candling processes.</li> <li>• Describe egg transfer, chick harvesting, grading, vaccination, as well as packaging and transportation.</li> <li>• Identify and describe protocols for hatchery cleaning and effective waste disposal/management.</li> </ul>	<ul style="list-style-type: none"> <li>• Summarize participants "expectations" using cards or any appropriate method.</li> <li>• PowerPoint presentation</li> <li>• Distribute training notes and handouts at the end of the module</li> </ul>
17.7.2. Hatchery design and biosecurity (15 minutes)	Session guide
<p><i>The facilitator makes a presentation on Hatchery design and biosecurity</i></p> <p><b>Plenary presentation (10 minutes)</b></p> <ul style="list-style-type: none"> <li>• Hatchery location</li> <li>• Size of hatchery</li> <li>• Hatchery design</li> <li>• Biosecurity of poultry hatchery facility</li> </ul>	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Group discussions</li> <li>• Plenary discussion</li> </ul>

<ul style="list-style-type: none"> <li>• Licensing of hatcheries</li> <li>• Types of incubators and their operations</li> </ul> <p><b>Plenary discussion (5 minutes)</b>  <i>Participants pose questions related to the presentation, receiving responses from the facilitator. Additionally, they engage in discussions sharing practical experiences regarding the hatchery designs and licensing protocols.</i></p>	<ul style="list-style-type: none"> <li>• Practical demonstration</li> </ul>
<b>17.7.3 Handling and managing hatching egg (15 minutes)</b>	<b>Session guide</b>
<p><i>The facilitator presents on key principles of hatching egg management.</i></p> <p><b>Plenary presentation (10 minutes)</b></p> <ul style="list-style-type: none"> <li>• Collection and placement in trays</li> <li>• Egg carrying trays</li> <li>• Egg grading</li> <li>• Egg storage conditions</li> </ul> <p><b>Group work (5minutes)</b>  <i>Trainees pose questions related to the presentation, receiving responses from the facilitator. Additionally, they engage in discussions sharing practical experiences regarding hatching egg management</i></p>	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Plenary discussions</li> </ul>
<b>17.7.4 Egg setting and incubation management (15 minutes)</b>	<b>Session guide</b>
<p><i>The facilitator presents slides on key principles of egg setting and incubator management.</i></p> <p><b>Plenary presentation and discussions (10 minutes)</b></p> <ul style="list-style-type: none"> <li>• Egg setting equipment</li> <li>• Egg fumigation</li> <li>• Incubation parameters-Temperature, Humidity, Ventilation, and egg turning.</li> <li>• Egg candling and transfer to the hatcher</li> <li>• Hatching parameters</li> <li>• Monitoring and Recording of the Parameters</li> </ul> <p><b>Group work (10 minutes)</b>  <i>Participants pose questions related to the presentation, receiving responses from the facilitator. Additionally, they engage in discussions sharing practical experiences regarding egg setting and incubation</i></p>	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Plenary discussions</li> </ul>



17.7.5 Egg hatcher management (15 minutes)	Session guide
<p><i>The facilitator presents on key principles on egg hatcher management</i></p> <p><b>Plenary Presentation and discussion (10 minutes)</b></p> <ul style="list-style-type: none"> <li>• Hatching parameters</li> <li>• Monitoring and Recording of the Parameters</li> </ul> <p><b>Group work (5 minutes)</b></p> <p><i>Participants pose questions related to the presentation, receiving responses from the facilitator. Additionally, they engage in discussions sharing practical experiences regarding egg hatcher management</i></p>	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Plenary discussions</li> </ul>
17.7.6 Chick Harvesting and distribution (15 minutes)	Session guide
<p><i>The facilitator presents on chick harvesting. Descriptions are made on chick handling, grading, vaccination, packaging, and final distribution.</i></p> <p><b>Plenary presentation (10 minutes)</b></p> <ul style="list-style-type: none"> <li>• Chick harvesting and grading.</li> <li>• Day old Chick vaccines and vaccination</li> <li>• Chick packaging and dispatch</li> <li>• Veterinary inspections</li> <li>• Hatchery and chick inspection</li> </ul> <p><b>Plenary discussion (5 minutes)</b></p> <p>Participants pose questions related to the presentation, receiving responses from the facilitator. Additionally, they engage in discussions sharing practical experiences regarding chick harvesting and distribution</p>	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Plenary discussions</li> </ul>
17.7.7 Hatchery cleaning and waste management (15 minutes)	Session guide
<p><i>The facilitator presents on hatchery cleaning procedures and waste disposal.</i></p> <p><b>Plenary presentation (10 minutes)</b></p> <ul style="list-style-type: none"> <li>• Cleaning and disinfecting hatchery equipment</li> <li>• Cleaning and disinfecting the hatchery</li> <li>• Types of hatchery wastes</li> <li>• Management of hatchery waste</li> <li>• Waste management certification by NEMA</li> </ul>	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Plenary discussions</li> </ul>

<p><b>Plenary discussion (5 minutes)</b></p> <p>Trainees pose questions related to the presentation, receiving responses from the facilitator. Additionally, they engage in discussions sharing practical experiences regarding cleaning and disinfection of the hatchery and managing the resulting waste</p>	
<p><b>17.7.8. Trouble shooting failures with egg incubation (15 Minutes)</b></p>	<p><b>Session guide</b></p>
<p><i>The facilitator presents on Trouble shooting failures with egg incubation.</i></p> <p><b>Plenary presentation (10 minutes)</b></p> <ul style="list-style-type: none"> <li>• Low hatchability</li> <li>• Deformed chicks <ul style="list-style-type: none"> <li>• Pipped eggs</li> <li>• Unhatched eggs</li> <li>• Infertile eggs</li> </ul> </li> </ul> <p><b>Plenary discussion (5 minutes)</b></p> <p><i>Trainees pose questions related to the presentation, receiving responses from the facilitator. Additionally, they engage in discussions sharing practical experiences regarding incubation failures.</i></p>	<ul style="list-style-type: none"> <li>• Powerpoint slides</li> <li>• Group discussions</li> <li>• Plenary discussions</li> </ul>
<p><b>17.7.8 Module Review (30 minutes)</b></p>	<p><b>Session guide</b></p>
<p><i>The facilitator guides trainees in reviewing the module, summarizing, and revisiting key training points.</i></p> <p><i>Participants reflect on the following:</i></p> <ul style="list-style-type: none"> <li>• New insights have you gained from the module</li> <li>• Opportunities identified through the module</li> <li>• Main takeaway message</li> </ul>	<p>Recap of the key take-home points using any of the following participatory methods:</p>



## 17.8 Reference materials

### 17.8.1 Participants' handouts

- Training notes on incubation and hatchery management

### 17.8.2 References

1. KARI (2006) Indigenous chicken production manual. *KARI Technical Note No. 18, February 2006* [https://www.kalro.org/fileadmin/publications/tech\\_notes/TecNote18\\_20060810.pdf](https://www.kalro.org/fileadmin/publications/tech_notes/TecNote18_20060810.pdf)
2. Guidelines to correct incubation programs | Royal Pas Reform Integrated hatchery solutions. (2016). Pasreform.com. <https://www.pasreform.com/en/knowledge/14/guidelines-to-correct-incubation-programs>.



## MODULE 18: AGRIBUSINESS AND MARKETING IN THE CHICKEN VALUE CHAIN

### Sub-Module 18.1: Agribusiness

#### 18.1.1 Introduction to the Sub-Module

This module is intended to provide service providers with a foundation on the basic concepts of agribusiness, i.e. farming as a business. Agribusiness encompasses the economic sectors for farming and farming-related commerce. It involves all the steps in getting agricultural goods to the market, including production, processing, and distribution. The industry is a traditional part of any economy, especially for countries with arable land and excess agricultural products for export. Some of the topics that shall be covered under agribusiness include: record keeping, marketing, economic analysis and business planning. Emphasis is placed on practical application of ideas and strategies in order to prepare a business and marketing plan for indigenous chicken enterprise. For the success of an indigenous chicken business enterprise, there is need to develop a business plan, maintain proper records, carry out a proper analysis of the enterprise and aggressively market the products once the enterprise is already in production. A business plan summarizes a company's operational, marketing, and financial objectives. It describes policies, strategies, and assumptions to help run your company, make financial forecasts, allocate resources, and anticipate potential issues. Records are an integral part of any business enterprise including commercial poultry production. They enable monitoring of progress of an enterprise, thus facilitating timely and effective decision making and interventions to enhance efficiency and profitability of the enterprise. Record keeping in chicken production involves documenting, filing, maintaining, and categorizing inventory, financial and production information for your flock. It can be accomplished by manual hand recording or by using computer



software. It is important for farmers to keep good records because they are essential tools for management and maintenance of successful flocks.

This module is necessary in reducing the disconnect between production and marketing with most farmers selling their produce at farm gate with very little value added. In most cases, farmers engage middlemen to link them to the produce market. These middlemen facilitate through engaging in upstream value chain activities like sorting, grading, packaging, storage and bulking that should otherwise have been undertaken by the farmer or farmer groups. In the process, the middlemen may earn more than the farmers. The module also builds capacity of the farmers in carrying out economic analysis to determine the profitability of the enterprise.

### **18.1.2 Learning Outcomes**

By the end of the training, the following outcomes should be achieved:

1. Business plan for indigenous chicken enterprise formulated and explained
2. The importance of record keeping in indigenous chicken farming explained
3. Cost benefit analysis of indigenous chicken production under different production systems described
4. Conducting gross margin analysis and computations for indigenous chicken production under different production systems described and explained
5. Profit and loss analysis and how to increase profits or minimize losses explained
6. Business planning for indigenous chicken production enterprise outlined and explained

### **18.1.3 Target Group and Categories**

This module targets agricultural extension service providers and agripreneurs based at sub-county and ward level. It will also be useful for lead farmers and private extension service providers dealing directly with farmer groups at community level.

### **18.1.4 Module Users**

This module is intended for use by trainer of trainers (TOT) in poultry production value chain master trainers who are members of the Core Team of Trainers (CTT), Lead Farmers and agripreneurs in the Dairy value chain in target Counties. The facilitator using this module should thoroughly familiarize themselves with the facilitator's guidelines and the participants' Handouts.

### **18.1.5 Module Duration**

The Module is estimated to take a total of **1 hour**

### 18.1.6 Module Summary

Indigenous Chicken Agribusiness			
Sessions	Training Methods	Training Materials	Time
18.1.6.1 Introduction and levelling expectations	<ul style="list-style-type: none"> <li>• Presentation</li> </ul>	<ul style="list-style-type: none"> <li>• Participants' Handouts</li> <li>• Felt pens, masking tapes and sticker glue</li> </ul>	5 minutes
18.1.6.2 Introduction to Business planning	<ul style="list-style-type: none"> <li>• Plenary presentation and discussions</li> <li>• PowerPoint presentation</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts felt pens</li> <li>• Projector</li> </ul>	5 minutes
18.1.6.3 Development of simple a business plan	<ul style="list-style-type: none"> <li>• PowerPoint Presentation</li> <li>• Plenary discussion</li> <li>• Group exercise</li> <li>• Plenary presentation</li> </ul>	<ul style="list-style-type: none"> <li>• Projector/Flip charts</li> <li>• Handouts</li> <li>• Note books</li> </ul>	15 minutes
18.1.6.4 Introduction to record keeping	<ul style="list-style-type: none"> <li>• Discussion</li> <li>• Power point Presentation</li> <li>• Direct instruction</li> </ul>	<ul style="list-style-type: none"> <li>• LCD projector</li> <li>• Flip charts, felt pens</li> </ul>	5 minutes
18.1.6.5 Importance of record keeping in IC farming	<ul style="list-style-type: none"> <li>• PowerPoint Presentation</li> <li>• Discussions</li> <li>• Demonstration</li> <li>• Practice by the trainee</li> </ul>	<ul style="list-style-type: none"> <li>• LCD projector</li> <li>• Flip chart, participants handouts, visuals,</li> <li>• Practical notes</li> </ul>	5 minutes
18.1.6.6 Types of records, their uses and characteristics	<ul style="list-style-type: none"> <li>• PowerPoint Presentation</li> <li>• Discussions</li> <li>• Demonstration</li> <li>• Practice by the trainee</li> </ul>	<ul style="list-style-type: none"> <li>• LCD projector</li> <li>• Flip chart, participants handouts, visuals,</li> <li>• Practical notes</li> </ul>	5 minutes



18.1.6.7 Record keeping demo/ practical exercise	<ul style="list-style-type: none"> <li>• PowerPoint Presentation</li> <li>• Discussions</li> <li>• Demonstration</li> <li>• Practice by the trainee</li> </ul>	<ul style="list-style-type: none"> <li>• LCD projector</li> <li>• Flip chart</li> <li>• Participants handouts</li> <li>• Photographs</li> </ul>	10 minutes
18.1.6.8 Identification of cost components in an indigenous chicken enterprise (Cash outflows)	<ul style="list-style-type: none"> <li>• Discussion</li> <li>• PowerPoint Presentation</li> <li>• Practice by the trainee</li> <li>• Direct instruction</li> </ul>	<ul style="list-style-type: none"> <li>• LCD projector</li> <li>• Flip charts, felt pens</li> </ul>	10 minutes
18.1.6.9 Identification of sources of income in the enterprise	<ul style="list-style-type: none"> <li>• Presentation</li> <li>• Group exercise</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint</li> <li>• Flip chart, participants handouts</li> <li>• Exercise guide</li> </ul>	5 minutes
18.1.6.10 Work out the gross margins and cost benefit Analysis (Net cash flow)	<ul style="list-style-type: none"> <li>• Presentation</li> <li>• Group exercise</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint</li> <li>• Exercise guide</li> </ul>	15 minutes
18.1.6.11 Module review	<ul style="list-style-type: none"> <li>• Participants' Facilitator's summary</li> </ul>	<ul style="list-style-type: none"> <li>• Participants'</li> <li>• Handouts module review</li> </ul>	5 minutes
<b>TOTAL</b>			<b>1 hour 25 minutes</b>

### 18.1.7 Facilitators' Guidelines

18.1.7.1 Introduction and levelling expectations (5 minutes)	Session Guide
<p><i>The facilitator introduces the module and invites participants to give their expectations. The module learning outcomes and expectations are also given by the facilitator</i></p> <p>By the end of this module, the trainee should be able to:</p> <ul style="list-style-type: none"> <li>• Understand the benefits of developing a business plan</li> <li>• Understand how to create and develop a business plan</li> <li>• Modalities to use in business development</li> <li>• Facilitate farmers or their groups in developing a marketing plan.</li> </ul>	<ul style="list-style-type: none"> <li>• Summarize Participants' expectations on a flipchart and make displays.</li> <li>• Distribute Participants' handouts on Module Objectives.</li> </ul>

<b>18.1.7.2 Introduction to business planning (5 minutes)</b>	<b>Session Guide</b>
<ul style="list-style-type: none"> <li>• Concise statement of your business mission and vision</li> <li>• Describes your products and services</li> <li>• Lists competitors and your value proposition relative to their products</li> <li>• Creates a road map for achieving your goals and objectives</li> <li>• Helps employees understand the goals and vision of the company</li> </ul>	<ul style="list-style-type: none"> <li>• Let the participants brainstorm and define the benefits of creating a business plan</li> <li>• Summarize discussion in flip charts</li> <li>• Participants' handouts on Definition, dimension and benefits</li> </ul>
<b>18.1.7.3 Development of a simple business plan (15 minutes)</b>	<b>Session Guide</b>
<p><b>Plenary presentation</b></p> <ul style="list-style-type: none"> <li>• Definition of a business plan and its importance</li> <li>• Take participants through developing a simple business plan</li> </ul>	<ul style="list-style-type: none"> <li>• Share training material and sample business plan template with trainees</li> </ul>
<b>18.1.7.4 Introduction, outcomes and expectations on Records and record keeping (5 minutes)</b>	<b>Session Guide</b>
<p><i>The facilitator introduces the next session and provides the learning outcomes and expectations</i></p> <p><b>Plenary presentation</b></p> <p><i>The trainees should be able to:</i></p> <ul style="list-style-type: none"> <li>• Understand record keeping</li> <li>• Explain the importance of record keeping in chicken farming</li> <li>• Describe the various types of records, their uses and characteristics</li> <li>• Prepare various types of records for IC</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Share training materials at the end of the module</li> </ul>



<b>18.1.7.5 Introduction to and importance of record keeping in chicken farming (5 minutes)</b>	<b>Session guide</b>
<p><i>The facilitator makes a presentation on record keeping and its importance</i></p> <p><b>Plenary discussion</b></p> <ul style="list-style-type: none"> <li>• The participants discuss the importance of records.</li> <li>• Any issue or questions arising is answered during this session.</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussion</li> </ul>
<b>18.1.7.6 Various types of records, their uses and characteristics (10 minutes)</b>	<b>Session guide</b>
<p><i>The facilitator makes a presentation on different types of records and their characteristics</i></p> <p><b>Plenary discussion</b></p> <ul style="list-style-type: none"> <li>• Facilitator responds to any questions and/or issues arising from the presentation</li> <li>• Discussion on various records chicken farmers keep and constraints of record keeping in their respective regions</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Plenary discussion</li> </ul>
<b>18.1.7.7. Record keeping demonstration and practical session (10 minutes)</b>	<b>Session guide</b>
<p><i>The facilitator takes the participants through various types of records and divides them into groups to prepare records during their break time</i></p> <p><b>Group discussion</b> can be used by farmers in their respective counties</p> <p><b>Plenary discussion</b> Any issue or questions arising is answered during this session.</p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Flip charts</li> <li>• Group work</li> <li>• Plenary discussions</li> </ul>
<b>18.1.7.8 Identification of cost components in an indigenous chicken enterprise (10 minutes)</b>	<b>Session Guide</b>
<p><b>Plenary presentation:</b></p> <ul style="list-style-type: none"> <li>• Agri-business in chicken enterprise?</li> <li>• Common terms used in business</li> <li>• Characteristics of a good IC business venture</li> <li>• Various cost components associated with the chicken production and marketing and strategies for minimizing costs without compromising quality</li> </ul> <p><b>Plenary discussion</b></p> <ul style="list-style-type: none"> <li>• Cost saving strategies in chicken agribusiness.</li> </ul>	<ul style="list-style-type: none"> <li>• Summarize participants' responses on a flip chart and display on the wall/board.</li> </ul>

	<ul style="list-style-type: none"> <li>• Participants' handouts on Definition and comparisons between farming and retail shop (business)</li> <li>• Participants' handouts on Common terms and characteristics of a good business</li> </ul>
<b>18.1.7.9. Identification of sources of income in the Enterprise (5 minutes)</b>	<b>Session Guide</b>
<p><b>Plenary presentation</b></p> <ul style="list-style-type: none"> <li>• Strategies of enhancing returns from the IC farming</li> </ul> <p><b>Plenary discussion</b></p> <ul style="list-style-type: none"> <li>• Income enhancement strategies in chicken agribusiness</li> </ul>	<ul style="list-style-type: none"> <li>• Each group brainstorms each question.</li> <li>• Power point presentation</li> <li>• Participants' handouts on Strategies to enhance returns from farming</li> </ul>
<b>18.1.7.10 Work out the gross margin analysis of indigenous chicken enterprise (15 minutes)</b>	<b>Session Guide</b>
<p><b>Plenary presentation</b></p> <ul style="list-style-type: none"> <li>• Definition and importance of economic analysis</li> <li>• Present different economic performance indicators (the Gross Margin Analysis, break even, cost benefit)</li> <li>• What are the benefits of economic analysis?</li> </ul> <p><b>Group exercise</b></p> <ul style="list-style-type: none"> <li>• Carry out gross margin analysis for IC value chains by filling in the chart provided</li> </ul> <p><b>Plenary discussion</b></p> <ul style="list-style-type: none"> <li>• Group presents and other comments on it.</li> </ul>	<ul style="list-style-type: none"> <li>• List answers on flip chart.</li> <li>• Distribute participants' handouts on farming gross margin analysis</li> <li>• Distribute participants' handout</li> <li>• Group exercise</li> </ul>



18.1.7.11 Module review (5 minutes)	Session Guide
<ul style="list-style-type: none"> <li>• Facilitator and participants review the module together</li> <li>• Participants identify new lessons learnt or challenges envisaged in implementing the module lessons</li> </ul>	Distribute participants module review/evaluation sheets

## **Sub-Module 18.2: Marketing of Chicken and Chicken Products**

### **18.2.1 Introduction to the Module**

This module is designed to enable trainers/facilitators to train farmers on marketing of indigenous chicken and related products. This is necessary in order to provide knowledge and skills necessary for market assessment and development of market plans. Participants will acquire knowledge on the basic concepts of marketing chicken and related products. For the success of a chicken business enterprise, there is need to aggressively market the products once the enterprise is already in production.

Marketing requires identifying and meeting customer needs and requirements. It provides information on a specific target market that includes identification of target customers/clientele. Marketing requires investing in research and analysis on target customers' demand; finding solutions that meet their needs at acceptable cost and quality; promoting offerings through different methods; and establishing long-term trusting relationships.

### **18.2.2 Learning Outcomes**

By the end of the training, the following outcomes should be achieved:

1. Market assessment described
2. Developing a marketing plan outlined and explained
3. Types of chicken markets and the supply and demand patterns determined and described.
4. Different marketing strategies, functions and marketing tools in the chicken value chain differentiated and explained.
5. Chicken and Chicken products marketing channels, marketing principles, value chain, distribution networks and the 7Ps (Product, price, promotion, place, people, packaging and process) of marketing described and explained.

### **18.2.3 Target Group and Categories**

This module targets agricultural extension service providers and agripreneurs based at sub-county and ward level. It will also be useful for private extension service providers dealing directly with farmer groups at community level and lead farmers

### **18.2.4 Module Users**

This module is intended for use by trainer of trainers (ToT) in poultry production value chain master trainers who are members of the Core Team of Trainers (CTT), Lead Farmers and agripreneurs in the IC value chain in target Counties. The facilitator using this module should thoroughly familiarize themselves with the Participants' Handouts.

### **18.2.5 Module Duration**

The Module is estimated to take of 1 hour 30 minutes



### 18.2.6 Module Summary

Marketing of Chicken and Chicken Products			
Sessions	Training Methods	Training Materials	Time
18.2.6.1 Introduction and levelling expectations	<ul style="list-style-type: none"> <li>Buzz</li> <li>Presentation</li> </ul>	<ul style="list-style-type: none"> <li>Participants' Handouts</li> <li>Felt pens, masking tapes and sticker glue</li> </ul>	5 minutes
18.1.6.2 Introduction to Agricultural Marketing	<ul style="list-style-type: none"> <li>Plenary presentation and discussions</li> <li>PowerPoint presentation</li> </ul>	<ul style="list-style-type: none"> <li>Flip charts felt pens</li> <li>Projector</li> </ul>	5 minutes
18.1.6.3 Marketing Mix (7Ps)	<ul style="list-style-type: none"> <li>Buzz activity</li> <li>Presentation discussion</li> </ul>	<ul style="list-style-type: none"> <li>Flip charts</li> <li>Handouts</li> </ul>	5 minutes
18.1.6.4 Collective marketing	<ul style="list-style-type: none"> <li>PowerPoint Presentation</li> <li>Plenary discussion</li> <li>Group exercise</li> <li>Plenary presentation</li> </ul>	<ul style="list-style-type: none"> <li>Projector/Flip charts</li> <li>Handouts</li> <li>Note books</li> </ul>	5 minutes
18.1.6.5 Consumer behaviour	<ul style="list-style-type: none"> <li>PowerPoint Presentation</li> <li>Plenary discussion</li> <li>Group exercise</li> <li>Plenary presentation</li> </ul>	<ul style="list-style-type: none"> <li>Samples for assessment</li> <li>Handout – Checklist/ tools</li> <li>Flip charts</li> </ul>	5 minutes
18.1.6.6 Developing a marketing plan	<ul style="list-style-type: none"> <li>Plenary discussion</li> <li>Group exercise</li> <li>Discussions</li> <li>PowerPoint</li> </ul>	<ul style="list-style-type: none"> <li>Participants' handouts</li> <li>Projector</li> <li>Flip charts, felt pens</li> </ul>	5 minutes
18.1.6.7 Module review	<ul style="list-style-type: none"> <li>Participants' Facilitator's summary</li> </ul>	<ul style="list-style-type: none"> <li>Participants' Handouts</li> <li>module review</li> </ul>	5 minutes
<b>Total</b>			<b>35 minutes</b>

### 18.2.7 Facilitators' Guidelines

18.2.7.1 Introduction and levelling expectations (5 minutes)	Session Guide
<p><i>The facilitator introduces the module and invites participants to give their expectations. The facilitator presents module objectives.</i></p> <p><b>Module objectives</b> By the end of the module participants should be able to:</p> <ul style="list-style-type: none"> <li>• Describe market assessment described</li> <li>• Outline and explain how to developing a marketing plan</li> <li>• Determine and explain the types of chicken markets and the supply and demand patterns.</li> <li>• Differentiate and explain different marketing strategies, functions and marketing tools in the chicken value chain.</li> <li>• Describe and explain chicken and chicken products marketing channels, marketing principles, value chain, distribution networks and the 7Ps (Product, price, promotion, place, people, packaging and process) of marketing described and explained.</li> </ul>	<ul style="list-style-type: none"> <li>• Summarize Participants' expectation on a flipchart and make displays.</li> <li>• Distribute Participants' Handouts on Module Objectives.</li> </ul>
18.2.7.2 Introduction to Agricultural Marketing (5 minutes)	Session Guide
<p><b>Plenary presentation:</b></p> <ul style="list-style-type: none"> <li>• Definition of marketing</li> <li>• Importance of marketing in indigenous chicken value chain</li> </ul> <p><b>Plenary discussion:</b> Discuss any questions or issues that arise from the presentation</p>	<ul style="list-style-type: none"> <li>• Summarize discussion on flip chats</li> <li>• Participants' handouts on definition, dimension and benefits of marketing in indigenous chicken production</li> </ul>
18.2.7.3 Marketing Mix (7Ps) (5 minutes)	Session Guide
<p><b>Plenary presentation</b></p> <ul style="list-style-type: none"> <li>• 7Ps (Product, price, promotion, place, people, packaging and process) marketing mix in indigenous chicken production</li> </ul> <p><b>Plenary discussion</b> Have some discussion on the 7Ps and questions arising from the presentation</p>	<ul style="list-style-type: none"> <li>• Distribute participants' handouts on Information required from a market assessment exercise.</li> </ul>



18.2.7.4 Collective marketing (5 minutes)	Session Guide
<b>Plenary presentation</b> The facilitator makes a PowerPoint presentation on: <ul style="list-style-type: none"> <li>Farmer marketing organizations and importance in indigenous chicken</li> <li>Farmer cooperatives and their application and importance in indigenous chicken</li> </ul>	<ul style="list-style-type: none"> <li>PowerPoint presentation</li> <li>Distribute Participants' Handouts on tools used in market assessment.</li> <li>Distribute Participants' Handouts on generic questions for a checklist or questionnaire</li> </ul>
18.2.7.5 Consumer behaviour (5 minutes)	Session Guide
<b>Plenary presentation and discussion</b> <ul style="list-style-type: none"> <li>Consumers patterns and behaviours</li> <li>Factors affecting consumer behaviour in indigenous chicken value chain</li> </ul>	<ul style="list-style-type: none"> <li>Participants' handouts on :Consumer behaviour and preferences</li> </ul>
18.2.7.6 Developing A Marketing Plan (5 minutes)	Session Guide
<b>Plenary presentation</b> <ul style="list-style-type: none"> <li>Attributes of an indigenous chicken marketing plan</li> <li>Advantages of developing a marketing plan</li> </ul> <b>Plenary discussion:</b> <ul style="list-style-type: none"> <li>Description of the target market for the produce</li> <li>Customer profile</li> <li>Competitor profile. Who are the other competitors to be aware of?</li> </ul>	<ul style="list-style-type: none"> <li>Distribute participants' handouts on: The Marketing guide</li> <li>Distribute participants' Handouts on Marketing plan template. If time allows they can complete the business plan report</li> </ul>
18.2.7.7 Module Review (5 minutes)	Session Guide
<ul style="list-style-type: none"> <li>Facilitator and participants review the module together</li> <li>Participants identify new lessons learnt or challenges envisaged in implementing the module lessons</li> </ul>	<ul style="list-style-type: none"> <li>Distribute participants module review/evaluation sheets</li> </ul>



## MODULE 19: CROSS-CUTTING THEMES IN CHICKEN PRODUCTION

This module consists of three cross-cutting issues that influence the uptake and up-scaling of TIMPs in the indigenous chicken value chain. These issues are Gender and socio-environmental concerns, Agricultural Innovation Platforms and Climate-Smart agricultural policy.

Gender and socio-environmental concerns are considerations aimed at providing appropriate solutions to value chain challenges with due regard to gender and social inclusion considerations. Agricultural Innovation Platforms provide a forum for stakeholders to interact and develop technical, institutional and organizational innovations to solve value chain challenges. Finally, Climate smart agricultural policy creates awareness on policy formulation and the various regulations that are put in place to facilitate the development of value chains. The methodology of delivery for each of these sub modules are presented here.

### Sub-Module 19.1: Gender, Vulnerable and Marginalized Groups, Social, Environmental Concerns and Cohesion

#### 19.1.1 Introduction to the Sub module

Indigenous chicken (IC) value chain enterprise is practiced in many rural and peri-urban households in Kenya. IC play an important role in household economies in ensuring food and nutritional security as well as reducing poverty. The enterprise



involves all the gender categories (men, women, youth vulnerable marginalized groups (VMGs) in its value chain from production, marketing and consumption. However, women perform most of the indigenous chicken value chain activities such as feeding, dung collection, cleaning and eggs collection.

Although women's contribution is substantial, gender inequalities still exist in all areas of the chicken value chain. Some gender inequalities include division of labour, access to and control of resources, and decision-making within and beyond the household. These inequalities limit women, youth, and VMGs access to and benefits from the various Technologies, Innovations, and Management Practices (TIMPs) at different nodes of the value chain. At the macro-level, the effective participation of women and youth is constrained by their inadequate access to resources such as credit, capital and land. Gender analysis examines the productive, community, and reproductive roles of men and women; access to and control of resources; levels of power relations; differential needs, constraints, and opportunities; and the impact of these differences (positive or negative) on the lives of men, women, youth, and the VMGs.

Indigenous chicken value chain TIMPs interventions, when designed and implemented with gender-equitable principles, can hasten adoption, leading to increased productivity as well as enhanced social and environmental impacts. The overall objective of this sub-module is to ensure that gender mainstreaming and social inclusion in the Indigenous chicken value chain is enhanced by field agricultural practitioners, agripreneurs and extension officers in an effort geared towards increasing agricultural productivity in target counties. This module introduces participants to issues on gender, VMGs, social, environmental concerns and cohesion in relation to indigenous chicken value chain.

### **19.1.2 Sub module learning outcomes**

By the end of the training sub module, the following training outcomes should be achieved:

1. The concept of gender mainstreaming and social inclusion in Indigenous chicken value chain described
2. Youth empowerment in Indigenous chicken value chain explained.
3. Women empowerment in Indigenous chicken value chain described and explained
4. Strategies for inclusion of vulnerable and marginalized groups in Indigenous chicken value chain identified and explained
5. Environmental and social management framework (ESMF) tool explained and demonstrated.

### **19.1.3 Sub module Target Group**

This sub module is intended for service providers, agripreneurs, lead farmers, and extension agents.

### 19.1.4 Sub module Users

This module is intended for use by Master trainers who are members of the core team of trainers (CTT) and the trained trainers. The trainers using this module should thoroughly familiarize themselves with the participants' handouts (training materials).

### 19.1.5 Sub module Duration

The sub module is estimated to take a duration of **1 hour**.

### 19.1.6 Module Summary

Sub module 19.1: Gender mainstreaming and social inclusion in the Indigenous chicken value chain			
Sessions	Training methods	Training materials	Duration
19.1.6.1 Introduction, expectations and objectives	<ul style="list-style-type: none"><li>• Personal introduction</li><li>• Presentations</li><li>• Plenary discussion</li></ul>	<ul style="list-style-type: none"><li>• Flips charts</li><li>• Felt pens</li><li>• PowerPoint Presentation</li><li>• Laptop</li><li>• Participants' handouts</li></ul>	5 minutes
19.1.6.2 Gender mainstreaming and social inclusion in Indigenous chicken value chain	<ul style="list-style-type: none"><li>• PowerPoint Presentations</li><li>• Group Exercise</li><li>• Plenary discussion</li></ul>	<ul style="list-style-type: none"><li>• Flips charts</li><li>• Felt pens</li><li>• PowerPoint Presentation</li><li>• Participants handouts</li></ul>	10 minutes
19.1.6.3 Youth empowerment in Indigenous chicken value chain	<ul style="list-style-type: none"><li>• PowerPoint Presentations</li><li>• Group exercise</li><li>• Plenary discussion</li></ul>	<ul style="list-style-type: none"><li>• Flips charts</li><li>• Felt pens</li><li>• PowerPoint Presentation</li><li>• Participants handouts</li></ul>	10 minutes
19.1.6.4 Women empowerment in Indigenous chicken value chain	<ul style="list-style-type: none"><li>• PowerPoint Presentations</li><li>• Plenary discussion</li></ul>	<ul style="list-style-type: none"><li>• Flips charts</li><li>• Felt pens</li><li>• PowerPoint Presentation</li><li>• Participants handouts</li></ul>	10 minutes
19.1.6.5 Strategies for inclusion of vulnerable and marginalized groups	<ul style="list-style-type: none"><li>• PowerPoint Presentations</li><li>• Plenary discussion</li></ul>	<ul style="list-style-type: none"><li>• Flips charts</li><li>• Felt pens</li><li>• PowerPoint Presentation</li><li>• Participants handouts</li></ul>	10 minutes



19.1.6.6 Environmental and Social Management Framework	<ul style="list-style-type: none"> <li>• PowerPoint Presentations</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Felt pens</li> <li>• PowerPoint Presentation</li> <li>• Participants handouts</li> </ul>	10 minutes
19.1.6.7 Sub module Review	<ul style="list-style-type: none"> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Felt pens</li> </ul>	5 minutes
<b>TOTAL</b>			<b>1 hours</b>

### 19.1.7 Facilitator's Guidelines

#### Sub module 19.1: Gender mainstreaming and social inclusion in Indigenous chicken value chain

19.1.7.1 Introduction, objectives and expectations (5 minutes)	Session Guide
<p><i>(The facilitator welcomes trainees to the sub module and thereafter invites them to introduce themselves and state their expectations).</i></p> <p><b>Sub module Objectives</b></p> <p><i>The facilitator presents modules objectives</i></p> <p>By the end of the module training, the trainee should be able to:</p> <ul style="list-style-type: none"> <li>• Describe the concept of gender mainstreaming and social inclusion in Indigenous chicken value chain.</li> <li>• Explain youth empowerment in Indigenous chicken value chain.</li> <li>• Describe and explain women empowerment in Indigenous chicken value chain.</li> <li>• Identify and explain strategies for inclusion of vulnerable and marginalized groups in Indigenous chicken value chain.</li> <li>• Demonstrate and explain environmental and social management framework (ESMF) tool.</li> </ul>	<ul style="list-style-type: none"> <li>• Summarize trainees “ex-pectations” and display.</li> <li>• PowerPoint Presentation</li> <li>• Group exercise</li> <li>• Training Pro-gram</li> </ul>

<b>19.1.7.2 Gender mainstreaming and social inclusion in Indigenous chicken value chain (10 minutes)</b> <i>(The facilitator presents and explain what gender mainstreaming is, who does what activity, who has access to what resources and who makes what decisions among others, and why gender mainstreaming is important in Indigenous chicken value chain).</i> <b>Plenary Presentation</b> <ul style="list-style-type: none"> <li>• Definition of gender</li> <li>• What is gender mainstreaming and why it is important?</li> <li>• Who does what? (gender division of roles in Indigenous chicken value chain)</li> <li>• Who owns what? (access and control of resources &amp; benefits)</li> <li>• Who makes which decisions?</li> </ul> <b>Group exercise and discussion</b> <i>Let the trainees recall what they learned and discuss any issues that may arise</i>	<b>Session Guide</b> <ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Group exercise</li> <li>• Plenary discussion</li> <li>• Participants' handouts</li> <li>• Group exercise</li> <li>• Plenary discussion</li> </ul>
<b>19.1.7.3 Youth empowerment in Indigenous chicken value chains (10 minutes)</b> <b>Plenary Presentation</b> <ul style="list-style-type: none"> <li>• Why agriculture is not attractive to youth</li> <li>• Youth's role in the value chain</li> <li>• Strategies to empower youth in Indigenous chicken value chain.</li> </ul> <i>Let the trainees recall what they learned and discuss any issues that may arise.</i>	<b>Session Guide</b> <ul style="list-style-type: none"> <li>• PowerPoint Presentation</li> <li>• Group exercise</li> <li>• Plenary discussion</li> <li>• Participants' handouts</li> </ul>
<b>19.1.7.4 Women empowerment in indigenous chicken value chain (10 minutes)</b> <b>Plenary Presentation</b> <ul style="list-style-type: none"> <li>• Women's role in the value chain</li> <li>• Challenges facing women in the value chain</li> <li>• Strategies for empowering women in the value chain</li> </ul> <b>Plenary discussion</b> <i>Let the trainees recall what they learned and discuss any issues that may arise.</i>	<b>Session Guide</b> <ul style="list-style-type: none"> <li>• PowerPoint Presentation</li> <li>• Participants' handouts</li> <li>• Plenary discussion</li> </ul>



<b>19.1.7.5. Strategies for inclusion of vulnerable and marginalized groups in Indigenous chicken value chain (10 minutes)</b>	<b>Session Guide</b>
<p><b>Plenary presentation</b></p> <ul style="list-style-type: none"> <li>• Who are vulnerable and marginalized groups (VMGs)</li> <li>• Why gender inequality exists</li> <li>• Social inclusion and why</li> <li>• Strategies of inclusion of VMG.</li> </ul> <p><b>Plenary discussion</b> Let the trainees recall what they learned and discuss any issues that may arise.</p>	<ul style="list-style-type: none"> <li>• PowerPoint Presentation</li> <li>• Plenary discussion</li> <li>• Participants' handouts</li> </ul>
<b>19.1.7.6. Environmental and social management framework (ESMF) (10 minutes)</b>	<b>Session Guide</b>
<p><b>Plenary presentation</b></p> <ul style="list-style-type: none"> <li>• Objective of ESMF in Indigenous chicken value chain</li> <li>• Environmental and social safeguards of Indigenous chicken</li> </ul> <p><b>Plenary discussion</b> Let the trainees recall what they learned and discuss any issues that may arise.</p>	<ul style="list-style-type: none"> <li>• PowerPoint Presentation</li> <li>• Plenary discussion</li> </ul>
<b>19.1.7.7 Sub module review (5 minutes)</b>	<b>Session Guide</b>
<p><i>(The facilitator leads the participants in reviewing the module)</i> Summarize the main points of the training and together with the trainees review the main points:</p> <ul style="list-style-type: none"> <li>• What is gender mainstreaming and why it is important?</li> <li>• Youth empowerment in Indigenous chicken value chain</li> <li>• Women empowerment in Indigenous chicken value chain</li> <li>• Strategies for inclusion of vulnerable and marginalized groups in Indigenous chicken value chain</li> <li>• Environmental and Social Management Framework of Indigenous chicken activities.</li> </ul> <p>Let the trainees recall what they learned and discuss any issues that may arise.</p>	<ul style="list-style-type: none"> <li>• Summary of the main points on from the module on a flip chart and display</li> </ul>

## **19.1.8 Reference Materials**

### **19.1.8.1 Participants' handouts**

- Gender mainstreaming and social inclusion factsheets
- Gender mainstreaming and social inclusion guides

### **19.1.8.2 References**

1. Sasmitha R., M. Pandiyan, M. Yuvaraj, T.Thilagavathi, M. Suganyadevi and M.Sivaji. (2020). Gender Mainstreaming and its Importance in Agriculture



## Sub-Module 19.2: Agricultural Innovation Platforms

### 19.2.1 Introduction to the Sub module

Agricultural Innovation Platforms provide a forum for stakeholders to interact and develop technical, institutional and organizational innovations to solve value chain challenges and it is a vehicle to make the system work and create a demand for innovations. Gender and social-environmental concerns are considerations aimed at avoiding inappropriate solutions to value chain challenges. Finally, Climate smart agricultural policy creates awareness on policy formulation and the various regulations that are put in place to facilitate the development of value chains. The methodology of delivery of each of these cross-cutting issues is presented.

Agricultural Innovation Platform (AIP) is an organizational model for stimulating innovation and development that brings actors together in a way that pools skills and knowledge to address challenges and utilize opportunities. The actors include individuals, private and public sector organizations, policy makers, agripreneurs and other value chain stakeholders. These actors come together in an innovation platform to seek technical, institutional or organizational solutions to critical challenges hindering agricultural productivity within a value chain. The AIP facilitates actors to interact, innovate, learn and change with time as they seek solutions to the common challenges. It is important to go into the system, connect with actors, and ensure that they work together. The situational needs should determine the kind of actors to bring on board. Every actor's contribution is valued and benefits accrue to all in a win-win situation.

Therefore, the AIP is a useful methodology for development, testing and scaling of innovations in the chicken value chain. The training module aims at enhancing practitioners' know-how in facilitating innovation platforms and it exposes the actors to an innovation systems-based configuration of stakeholders. This module consists of issues that influence the uptake and up-scaling of TIMPs in the Poultry value chain. These issues are Agricultural Innovation Platforms, Gender and social-environmental concerns and Climate smart agricultural policy.

### 19.2.2 Sub-Module Learning Outcomes

By the end of this module, the following outcomes should be achieved:

1. Innovation platforms defined and explained
2. The characteristics of an AIP described and explained
3. Process of mobilization of stakeholders for initiation, establishment, management and sustenance of an AIP explained and demonstrated
4. Business model development process of an AIP demonstrated and explained
5. The innovation capacity building process of the AIP actors outlined and explained.
6. Benefits and challenges of AIP described
7. The sustainability of an AIP (exit strategy) explained

### 19.2.3 Sub-Module Target Group and Categories

The target users are county extension staff, agripreneurs, private agricultural service providers and lead farmers at sub-county and ward level.

### 19.2.4 Sub-Module Users

This module is intended for use by master trainers who are members of the Core Team of Trainers (CTT) and lead farmers. The facilitator using this module should have an in-depth understanding of the participants' handouts.

### 19.2.5 Sub-Module Duration

The module is estimated to take a minimum of **1 hour** and where time allows, a field trip will be conducted

### 19.2.6 Module Summary

Innovation platforms explained and understood			
Sessions	Training methods	Training materials	Time
19.2.6.1 Introduction, objectives and expectations	<ul style="list-style-type: none"><li>• Personal introductions</li><li>• Presentations</li><li>• Plenary discussions</li></ul>	<ul style="list-style-type: none"><li>• Flips charts</li><li>• PowerPoint presentation</li><li>• Laptop</li><li>• Projector</li></ul>	5 minutes
19.2.6.2 Definition of Agricultural Innovation Systems and different types of innovations	<ul style="list-style-type: none"><li>• Plenary presentations</li><li>• Flip charts</li><li>• Plenary discussions</li></ul>	<ul style="list-style-type: none"><li>• Flip charts</li><li>• PowerPoint presentation</li><li>• Laptop</li><li>• Projector</li><li>• Participants' handouts</li></ul>	5 minutes
19.2.6.3. Characteristics of an innovation platform <ul style="list-style-type: none"><li>• Dissemination and scaling</li><li>• Enhancing information flow and learning</li><li>• Making value chain work</li><li>• Enhancing resource efficiency</li></ul>	<ul style="list-style-type: none"><li>• Plenary presentation</li><li>• Plenary discussion</li><li>• Role plays</li><li>• Flips charts</li></ul>	<ul style="list-style-type: none"><li>• Laptop</li><li>• Projector</li><li>• Participants' hand outs</li></ul>	5 minutes



<ul style="list-style-type: none"> <li>• Enhancing innovation and creativity</li> <li>• Enhancing farmer capacity</li> </ul>			
19.2.6.4 Phases of an innovation platform (Initiation, Establishment, Management and Sustenance	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• presentations</li> <li>• Plenary discussions</li> <li>• Role plays</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• PowerPoint presentation</li> <li>• Laptop</li> <li>• Projector</li> <li>• Participants' hand outs</li> </ul>	5 minutes
19.2.6.5 Case studies of a successful Innovation Platform ( <i>Select the nearest to the training venue</i> ) <ul style="list-style-type: none"> <li>• (Analogy of African funeral)</li> <li>• e.g. Agro-Kenya (NGO)-Kakamega</li> </ul>	<ul style="list-style-type: none"> <li>• Plenary presentations</li> <li>• Plenary discussions</li> <li>• Role plays</li> </ul>	<ul style="list-style-type: none"> <li>• Laptop</li> <li>• Projector</li> <li>• Participants' hand outs</li> </ul>	5 minutes
19.2.6.6 Benefits and challenges of AIPS	<ul style="list-style-type: none"> <li>• Plenary presentations</li> <li>• Plenary discussions</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• Laptop</li> <li>• Projector</li> <li>• Participants' hand outs</li> </ul>	5 minutes
19.2.6.7. Field trip	<ul style="list-style-type: none"> <li>• Discussion</li> <li>• Practical demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pens</li> </ul>	8 hours
19.2.6.8. Cross cutting factors <ul style="list-style-type: none"> <li>• Gender issues for inclusivity</li> <li>• Scale: Need to factor this from outset</li> <li>• Policy influencing and advocacy</li> <li>• Communication and capacity strengthening</li> </ul>	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Plenary discussions</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• Laptop</li> <li>• Projector</li> <li>• Participants' hand outs</li> </ul>	5 minutes

19.2.6.9. Module review	<ul style="list-style-type: none"> <li>• PowerPoint presentations</li> <li>• Plenary discussions</li> </ul>	<ul style="list-style-type: none"> <li>• Flip charts</li> <li>• Laptop</li> <li>• Projector</li> </ul>	5 minutes
<b>TOTAL</b>			<b>1 hours</b>

### 19.2.7 Facilitator's Guidelines

Sub Module 19 Agricultural Innovation Platform (AIP)	
19.2.7.1. Introduction, levelling of expectations and objectives (5 minutes)	Session Guide
<p><b>Introduction</b>  <i>(The facilitator welcomes trainees to the module and then invites them to introduce themselves and state their expectations)</i></p> <p><b>Module Objectives</b>  <i>(The facilitator presents modules objectives and levels out expectations)</i></p> <p>By the end of the module the trainee should be able to:</p> <ul style="list-style-type: none"> <li>• Define innovation process and the innovation products.</li> <li>• Explain characteristics of an innovation platform.</li> <li>• Describe how to initiate and establish Agricultural Innovation Platforms.</li> <li>• Explain how to manage and sustain innovation capacity of actors in Agricultural Innovation Platforms.</li> <li>• Get exposed to successful apiculture innovation platforms</li> <li>• Understand benefits and challenges of agricultural innovation platforms.</li> </ul>	<ul style="list-style-type: none"> <li>• Summarize Trainees' "expectations" and display.</li> <li>• PowerPoint Presentation</li> <li>• Training Program</li> </ul>
19.2.7.2 Definition of Agricultural Innovation Systems and different types of innovations (technical, institutional and organizational) (5 minutes)	Session Guide
<p>The facilitator presents an overview of innovation platforms and their main characteristics</p> <p><b>Plenary Presentation</b></p> <ul style="list-style-type: none"> <li>• Past progression of research and extension models and their shortcomings</li> <li>• Agricultural Innovation Systems perspective and Agricultural Innovation Platforms model</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint Presentation</li> <li>• Participants' handouts</li> </ul>



<ul style="list-style-type: none"> <li>• Comparison of Agricultural Innovation Platforms with social and technical events working through committees with different roles but common goals</li> <li>• Value chain actor linkages and other benefits</li> </ul> <p><b>Plenary Discussion</b></p> <ul style="list-style-type: none"> <li>• Let the trainees recall what they learned and discuss any issues that may arise.</li> </ul>	
<b>19.2.7.3. Characteristics of an Agricultural Innovation Platform (5 minutes)</b>	<b>Session Guide</b>
<p><b>Plenary Presentation</b></p> <ul style="list-style-type: none"> <li>• Characteristics of Agricultural Innovation Platforms</li> <li>• Why Agricultural innovation platforms are used</li> <li>• Where to form Agricultural Innovation Platforms</li> <li>• Establishment of linkages between value chain actors in agricultural innovation platforms</li> </ul> <p><b>Discussion</b></p> <p>Let the trainees recall what they learned and discuss any issue that may arise.</p>	<ul style="list-style-type: none"> <li>• PowerPoint Presentation</li> <li>• Participants' handouts</li> <li>• Plenary discussion</li> </ul>
<b>19.2.7.4 Stages of an innovation platform (Initiation, Establishment, Management and Sustenance (5 minutes))</b>	<b>Session Guide</b>
<p><b>Plenary Presentation</b></p> <p><b>Initiation or preformation phase</b></p> <ul style="list-style-type: none"> <li>• Engagement or mobilization of stakeholders in the poultry value chain to lay down rules of engagement mediated by a change agent</li> </ul> <p><b>Establishment phase</b></p> <ul style="list-style-type: none"> <li>• Assessment of the status of the value chain to clearly identify the compelling; the weaknesses in the chains.</li> <li>• Planning, defining roles and establish working structure and resource acquisition</li> </ul> <p><b>Sustainability</b></p> <ul style="list-style-type: none"> <li>• Guiding in evolving and identifying fresh issues or challenges</li> <li>• Maintaining capacity acquired to address new issues or challenges in subsequent cycles.</li> </ul> <p><b>Plenary discussion</b></p> <p>Let the trainees recall what they learned and discuss any issue that may arise.</p>	<ul style="list-style-type: none"> <li>• PowerPoint Presentation</li> <li>• Distribute participants handouts</li> <li>• Short video clips</li> </ul>

19.2.7. 5 Case studies of successful AIPS (5 minutes)	Session Guide
<p>e.g. Agro-Kenya (NGO) – Kakamega</p> <p>- Analogy of African funeral</p> <ul style="list-style-type: none"> <li>• Invite a participant from the successful AIP to make a presentation</li> <li>• Plenary</li> <li>• Let the trainees recall what they learned and discuss any issue that may arise.</li> </ul>	<ul style="list-style-type: none"> <li>• Participants' handouts</li> <li>• Marketing models and pathways</li> <li>• Case study reports</li> </ul>
19.2.7.6 Benefits and challenges of AIPS ( 5 minutes)	Session Guide
<p><b>Plenary presentation</b></p> <p>List the benefits of a successful AIP</p> <ul style="list-style-type: none"> <li>• Participants reflect on what they want to do at home in terms of AIP initiation then develop concrete and achievable action plans based on a challenge that they could address back home.</li> <li>• Involvement of all the stakeholders in the apiculture value chain that will ensure easy flow of operations.</li> </ul> <p><b>Plenary discussion</b></p> <ul style="list-style-type: none"> <li>• Discuss the challenges associated with running a successful AIP for indigenous chicken and mitigation measures</li> </ul>	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Champions selected to campaign for attitude change</li> </ul>
19.2.7.7. Field trip to a successful Innovation Platform (20 minutes)	Session Guide
<ul style="list-style-type: none"> <li>• Visit to a successful innovation platform nearby</li> </ul>	<ul style="list-style-type: none"> <li>• Bus to ferry participants</li> <li>• Logistics aspects</li> </ul>
19.2.7.8. Cross cutting issues (5 minutes)	Session Guide
<p><b>Plenary presentation</b></p> <ul style="list-style-type: none"> <li>• Gender issues – for inclusivity</li> <li>• Scale: Need to factor this from outset</li> <li>• Policy influencing and advocacy</li> <li>• Communication and capacity strengthening</li> </ul>	<ul style="list-style-type: none"> <li>• Presentations</li> <li>• General discussions</li> </ul>



19.2.7.9. Module review (5 minutes)	Session Guide
<p><i>(The facilitator leads the trainees in reviewing the module)</i></p> <p>Summarize the main points of the training and together with the trainees review the main points on:</p> <ul style="list-style-type: none"> <li>• AIP characteristics and initiation</li> <li>• AIP establishment and management</li> <li>• Sustenance of apiculture AIPs</li> <li>• Discuss with trainees’ new things learnt from this Module.</li> <li>• What are some of the problems and issues that they have become more aware of in the module?</li> </ul>	<ul style="list-style-type: none"> <li>• Participants handouts</li> <li>• Administer online exit questionnaire and present analysis real time</li> </ul>

## 19.2.8 Reference materials

### 19.2.8.1 Participants’ handouts

- AIP Fact sheets
- Entry and exit questionnaire on their smart forms
- Agricultural Innovation Platform establishment guide
- Summary of key policies

### 19.2.8.2 References

1. Felister Makini, Wellington Mulinge, Lawrence Mose, Beatrice Salasya, Geoffrey Kamau, Margaret Makelo, and Ong’ala, J. (2018). Impact of Agricultural Innovation Platforms on Smallholder livelihoods in Eastern and Western Kenya. FARA Research Results Vol. 2 (6) 3.
2. Felister. Makini, G. Kamau, M. Makelo, A. Adekunle, G. Mburathi. (2013). Operational field guide for developing and managing local agricultural innovation platforms.
3. Hagmann, J, Connolly, M., Ficarelli, P., Ramaru, J. (2002): The Service Delivery Framework: Understanding the development of service systems as a systemic change and negotiation process within and across three levels of demand and supply. Published on [www.picoteam.org](http://www.picoteam.org).
4. Kamau, G.M. and Makini F.W. (2019). Agricultural Innovation Platforms for knowledge exchange and learning for technical, economic, social and institutional changes.

## Sub-Module 19.3: Policies and Regulations

### 19.3.1 Introduction to the Sub module

As smallholder farmers play a vital role in Kenya's chicken industry, it is imperative to equip them with the understanding and tools needed to comply with policies, make informed decisions, and optimize their chicken enterprises. This training program is structured into comprehensive modules that delve into various aspects of chicken policies and regulations, ranging from compliance and advocacy to market access and sustainability. This sub-module on chicken policies and regulations for smallholder farmers in Kenya is designed to empower poultry practitioners with essential knowledge and skills to effectively navigate the regulatory framework governing the sector. By the end of this training, participants will be better equipped to embrace the opportunities and challenges presented by the chicken regulatory landscape, fostering a more sustainable and economically viable chicken sector in Kenya.

### 19.3.2 Sub module learning outcomes

By the end of the training sub module, the following training outcomes must be achieved:

1. Key chicken policies and regulations identified.
2. Compliance and record-keeping explained.
3. Quality and safety standards outlined and explained.
4. Environmental and sustainability regulations identified and explained.
5. Market Access and trade regulations described.
6. Health and animal welfare regulations identified and explained.
7. Consumer protection regulations identified and explained.
8. Policy advocacy and engagement process explained.

### 19.3.3 Sub module Target Group

This sub module is intended for service providers, agripreneurs, lead farmers, and extension agents.

### 19.3.4 Sub module Users

This module is intended for use by Master trainers who are members of the core team of trainers (CTT) and the trained trainers. The trainers using this module should thoroughly familiarize themselves with the participants' handouts (training materials).

### 19.3.5 Sub module Duration

The sub module is estimated to take a duration of **1 hour**



### 19.3.6 Module Summary

Sub module 19.3: Policy options and regulations in the Chicken value chain			
Sessions	Training methods	Training materials	Duration
19.3.6.1 Introduction, expectations and objectives	<ul style="list-style-type: none"> <li>• Personal introduction</li> <li>• Plenary Presentations</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Felt pens</li> <li>• PowerPoint Presentation</li> <li>• Laptop</li> </ul>	5 minutes
19.3.6.2 Introduction to Chicken Policies and Regulations	<ul style="list-style-type: none"> <li>• Plenary Presentation</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint projector,</li> <li>• Flip charts, felt pens</li> <li>• Laptop</li> </ul>	5 minutes
19.3.6.3 Compliance and Record-Keeping	<ul style="list-style-type: none"> <li>• Plenary Presentation</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Felt pens</li> <li>• PowerPoint Presentation</li> <li>• Participants handouts</li> </ul>	10 minutes
19.3.6.4 Quality and Safety Standards	<ul style="list-style-type: none"> <li>• Plenary Presentation</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Felt pens</li> <li>• PowerPoint Presentation</li> <li>• Participants handouts</li> </ul>	10 minutes
19.3.6.5 Environmental and Sustainability Regulations	<ul style="list-style-type: none"> <li>• Plenary Presentation</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Felt pens</li> <li>• PowerPoint Presentation</li> <li>• Participants handouts</li> </ul>	5 minutes
19.3.6.6 Health and Animal Welfare Regulations	<ul style="list-style-type: none"> <li>• Plenary Presentation</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Felt pens</li> <li>• PowerPoint Presentation</li> <li>• Participants handouts</li> </ul>	5 minutes
19.3.6.7 Market Access and Trade Regulations	<ul style="list-style-type: none"> <li>• PowerPoint Presentations</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Felt pens</li> <li>• PowerPoint Presentation</li> <li>• Participants handouts</li> </ul>	5 minutes

19.3.6.8 Consumer Protection Regulations	<ul style="list-style-type: none"> <li>• Plenary Presentation</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Felt pens</li> <li>• PowerPoint Presentation</li> <li>• Participants handouts</li> </ul>	5 minutes
19.3.6.9 Policy Advocacy and Engagement	<ul style="list-style-type: none"> <li>• Plenary presentation</li> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Felt pens</li> <li>• PowerPoint Presentation</li> <li>• Participants handouts</li> </ul>	5 minutes
19.3.6.10 Sub module Review	<ul style="list-style-type: none"> <li>• Plenary discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Flips charts</li> <li>• Felt pens</li> </ul>	5 minutes
<b>Total</b>			<b>1 hours</b>

### 19.3.7 Facilitator's Guidelines

Sub module 19.3: Policy options and regulations in the Chicken value chain	
19.3.7.1 Introduction, Objectives and Expectations (5 minutes)	Session Guide
<p><i>(The facilitator welcomes trainees to the sub module and thereafter invites them to introduce themselves and state their expectations).</i></p> <p><b>Sub module Objectives</b>  <i>The facilitator presents modules objectives</i>  By the end of the module training, the trainees should be able to:</p> <ul style="list-style-type: none"> <li>• Identify and explain key chicken policies and regulations.</li> <li>• Explain compliance and record-keeping explained.</li> <li>• Outline and explain quality and safety standards outlined and explained.</li> <li>• Identify and explain environmental and sustainability regulations identified and explained.</li> <li>• Describe market Access and trade regulations described.</li> <li>• Identify and explain health and animal welfare regulations identified and explained.</li> <li>• Identify and explain consumer protection regulations.</li> <li>• Explain policy advocacy and engagement process.</li> </ul>	<ul style="list-style-type: none"> <li>• Summarize trainees “expectations” and display.</li> <li>• PowerPoint Presentation</li> <li>• Group exercise</li> <li>• Training Program</li> </ul>



19.3.7.2 Introduction to Chicken Policies and Regulations (5 minutes)	Session Guide
<p><i>(The facilitator should be able to lead participants in understanding the current policies and regulations related to chicken farming, which trainees need to be aware of as they practice chicken farming)</i></p> <p><b>Plenary Presentation</b> The facilitator gives highlights on:</p> <ul style="list-style-type: none"> <li>• Key policies, regulations and the regulatory bodies involved in the chicken sector.</li> <li>• Licensing procedures, and quality standards for chicken products. Emphasis should be placed on animal health, welfare regulations, and environmental sustainable practices.</li> <li>• Pricing mechanisms, marketing channels, and relevant financial support programs.</li> <li>• Government initiatives, compliance requirements, and potential penalties for non-compliance.</li> </ul> <p><b>Group exercise and discussion</b> Let the trainees recall what they learned and discuss any issues that may arise</p>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Group exercise</li> <li>• Plenary discussion</li> <li>• Participants' handouts</li> <li>• Group exercise</li> <li>• Plenary discussion</li> </ul>
19.3.7.3 Compliance and Record-Keeping (10 minutes)	Session Guide
<p><b>Plenary Presentation</b> <i>(The facilitator should be able to lead participants in understanding how to be compliant with the set policies and regulations and the importance of record keeping)</i></p> <p><b>Plenary Presentation</b> The facilitator gives highlights on:</p> <ul style="list-style-type: none"> <li>• The importance of adherence to regulatory requirements.</li> <li>• Specific documentation and record-keeping obligations imposed by relevant authorities. This includes maintaining comprehensive records related to animal health, milk production, and farm management practices.</li> <li>• The significance of accurate record-keeping to demonstrate compliance during inspections.</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint Presentation</li> <li>• Group exercise</li> <li>• Plenary discussion</li> <li>• Participants' handouts</li> </ul>

<ul style="list-style-type: none"> <li>Types of records required for financial reporting, environmental impact assessments, and any other regulatory audits. Emphasizing the potential consequences of non-compliance, such as penalties or legal ramifications, is essential.</li> </ul> <p><b>Plenary discussion</b> Let the trainees recall what they learned and discuss any issues that may arise.</p>	
<b>19.3.7.4 Quality and Safety Standard (10 minutes)</b>	<b>Session Guide</b>
<p><i>(The facilitator should be able to lead participants in understanding compliance with quality and safety standards)</i></p> <p><b>Plenary Presentation</b> The facilitator will impart knowledge and information on:</p> <ul style="list-style-type: none"> <li>Proper egg and chicken meat handling, storage, and transportation protocols to maintain quality and prevent contamination. Emphasis will be on hygiene and sanitation practices, temperature control guidelines, packaging standards, and the importance of accurate labelling to ensure product integrity.</li> <li>Regulatory compliance with national and international standards, and emphasis on consequences for non-compliance.</li> <li>Traceability to ensure the safety and quality of chicken products.</li> </ul> <p><b>Plenary discussion</b> Let the trainees recall what they learned and discuss any issues that may arise.</p>	<ul style="list-style-type: none"> <li>PowerPoint Presentation</li> <li>Participants' handouts</li> <li>Plenary discussion</li> </ul>
<b>19.3.7.5. Environmental and Sustainability Regulations (5 minutes)</b>	<b>Session Guide</b>
<p><i>(The facilitator should be able to lead participants understand sustainable and environmentally friendly practices)</i></p> <p><b>Plenary presentation</b> The facilitator will impart knowledge and information on:</p> <ul style="list-style-type: none"> <li>Understanding the regulations related to observing practices that minimise environmental impacts including effective waste management, recycling of waste materials, and other sustainable land use practices</li> </ul> <p><b>Plenary discussion</b> Let the trainees recall what they learned and discuss any issues that may arise.</p>	<ul style="list-style-type: none"> <li>PowerPoint Presentation</li> <li>Plenary discussion</li> <li>Participants' handouts</li> </ul>



<b>19.3.7.6. Animal Health and Animal Welfare Regulations (5 minutes)</b>	
<p><i>(The facilitator presents the learning outcomes for the topic health and animal welfare regulations)</i></p> <p><b>Plenary presentation</b></p> <p>Facilitator will impact knowledge and information on:</p> <ul style="list-style-type: none"> <li>• The existing health and animal welfare regulation, as well as compliance.</li> <li>• Practical guidance on disease prevention, vaccination protocols, and proper animal care practices</li> </ul> <p><b>Plenary discussion</b></p> <p>Let the trainees recall what they learned and discuss any issues that may arise</p>	<ul style="list-style-type: none"> <li>• PowerPoint Presentation</li> <li>• Plenary discussion</li> <li>• Participants' handouts</li> </ul>
<b>19.3.7.7. Market Access and Trade Regulations (5 minutes)</b>	<b>Session Guide</b>
<p><i>(The facilitator should be able to lead participants in understanding market access and trade regulations for chicken)</i></p> <p><b>Plenary presentation (30 minutes)</b></p> <p>The facilitator will impact knowledge and information on:</p> <ul style="list-style-type: none"> <li>• Local and international regulations governing chicken farming and trade.</li> <li>• Practical guidance on market entry requirements, including obtaining licenses and certifications.</li> <li>• Thorough coverage of quality standards, tariffs, duties, and trade agreements, and practical tips on documentation and record-keeping.</li> </ul> <p><b>Plenary discussion</b></p> <p>Let the trainees recall what they learned and discuss any issues that may arise.</p>	<ul style="list-style-type: none"> <li>• PowerPoint Presentation</li> <li>• Plenary discussion</li> </ul>
<b>19.3.7.8. Consumer Protection Regulations (5 minutes)</b>	
<p><i>(The facilitator to present to participants the existing regulations on consumer protection)</i></p> <p><b>Plenary presentation (30 minutes)</b></p> <p>The facilitator will impact knowledge and information on:</p> <ul style="list-style-type: none"> <li>• Existing regulations on consumer protection</li> <li>• Accurate product labelling, nutritional information and expiration dates, to provide consumers with transparent and informative choices.</li> <li>• Quality and safety standards to deliver products that meet or exceed regulatory requirements</li> </ul> <p><b>Plenary discussion</b></p> <p>Let the trainees recall what they learned and discuss any issues that may arise</p>	

<p><b>19.3.7.9 Policy Advocacy and Engagement (5 minutes)</b></p> <p><i>(The facilitator to present to participants the existing regulations on consumer protection)</i></p> <p><b>Plenary presentation</b></p> <p>The facilitator will impact knowledge and information on:</p> <ul style="list-style-type: none"> <li>• Identifying the problem</li> <li>• Analysis and assessment of consequences of the identified problem/policy gap.</li> <li>• Articulating policy options</li> <li>• Stakeholders' analysis and involvement.</li> <li>• Public awareness raising and actions</li> <li>• Policy monitoring and evaluation</li> <li>• Effective lobbying strategies, including building relationships with policymakers and participating in advocacy campaigns</li> </ul> <p><b>Plenary discussion</b></p> <p>Let the trainees recall what they learned and discuss any issues that may arise</p>	
<p><b>19.3.7.10 Sub module review (5 minutes)</b></p> <p><i>(The facilitator leads the participants in reviewing the module)</i></p> <p>Summarize the main points of the training and together with the trainees review the main points on the:</p> <ul style="list-style-type: none"> <li>• Relevant policies, laws, and regulations governing the chicken sector including knowledge of animal health, milk quality, environmental standards, and market access regulations.</li> <li>• Trainees responsibilities as outlined in the policies and regulations.</li> <li>• What is expected of trainees in terms of compliance, reporting, and best practices.</li> <li>• Policy advocacy and engagement process</li> </ul> <p>Let the trainees recall what they learned and discuss any issues that may arise.</p>	<p><b>Session Guide</b></p>

### 19.3.8 References

The Kenya Chicken Industry Regulations, 2021.



## ANNEXES

### Annex 1: Training Program

The training program presented here assumes that the trainees report on Sunday evening as the first day

Time	Activity	Duration	Lead/Resource Persons
Day 0: Sunday	Travel and Arrival	Whole day	KALRO NRI and VC Leader – Peter Alaru
<b>Day 1: Monday</b>	<b>Chair: Dr. Elkana Nyambati, Asst. Director Livestock Systems)</b> <b>Rapporteur:</b>		<b>Facilitator</b>
8.00 a.m.-8.30 a.m.	Registration	30 mins.	KALRO NRI Secretariat
	Opening Prayer and Introductions		Mr. Peter Alaru
8.30 a.m.-10.00a.m.	<b>Official opening of the Indigenous Chicken Value Chain ToT Workshop</b>	1hr 30 mins.	Dr. David Changwony (Chair)
	Indigenous Chicken ToT Workshop Objectives		Mr. Peter Alaru
	Remarks from Director Livestock Systems and Welcoming Deputy Director General – Livestock		Dr. David Changwony
	Remarks from Deputy Director General - Livestock and Official Opening		Dr. Evans Ilatsia
	GROUP PHOTO		ALL
10.00 a.m.-10.30 a.m.	Climate setting and class organization	30 mins.	
<b>10.30 a.m.-11.00a.m.</b>	<b>HEALTH BREAK</b>	<b>30 mins.</b>	<b>ALL</b>
11.00a.m.– 12.00p.m.	Farmer field and business school (FFBS) approach in indigenous chicken production	1 hour.	Mark Otieno
12.00 p.m. –1.00p.m.	Poultry Industry in Kenya and its impact on economy	1 hour	Ochieng Ouko
<b>1.00 p.m.- 2 .00 p.m.</b>	<b>LUNCH BREAK</b>	<b>1 hour</b>	<b>ALL</b>
2.00 p.m. –4.00 p.m.	Climate Change and Climate Smart Agriculture in indigenous chicken value chain	2 hour	Ann Wachira
<b>4.00 p.m.</b>	<b>HEALTH BREAK</b>		<b>ALL</b>

Time	Activity	Duration	Lead/Resource Persons
<b>Close of Day 1</b>			
<b>Day 2: Tuesday</b>	<b>Chair: Dr. Mungube Rapporteur:</b>	<b>Period</b>	<b>Facilitator</b>
8.00 a.m. – 8.30 a.m.	Registration, Prayer Recap of Day1 activities	30 mins.	
8.30 a.m. – 9.30 a.m.	Production systems and Housing for Indigenous chicken	1 hr.	Gladys Wangui
9.30 a.m.-10.30 a.m.	Indigenous Chicken Breeding and Selection	1 hr.	Ochieng Ouko
<b>10.30 a.m.-11.00 a.m.</b>	<b>HEALTH BREAK</b>	<b>30 mins.</b>	<b>ALL</b>
11.00 a.m.-1.00 p.m.	Incubation and Hatchery Management	2 hrs.	Peter Alaru
<b>1.00 p.m.-2.00 p.m.</b>	<b>LUNCH BREAK</b>	<b>1hr.</b>	<b>ALL</b>
2.00 p.m. - 3.00 p.m.	Chick Brooding	1 hour	Martin Macharia
3.00 p.m.-4.00 p.m.	Indigenous Breeder Flock Management	1 hour	Ochieng Ouko
<b>4.00 p.m -4.30 p.m.</b>	<b>HEALTH BREAK</b>	<b>30 mins.</b>	<b>ALL</b>
<b>End of day 2</b>			
<b>Day3: Wednesday</b>	<b>Chair: Dr. Wachira Rapporteur:</b>	<b>Period</b>	<b>Facilitator</b>
8.00 a.m. – 8.30 a.m.	Registration, Prayer Recap of Day 2 activities	30 mins.	Gladys Wangui
8.30 a.m.– 10.30 a.m.	Indigenous Chicken Feeds and Feed Formulation Methods	2 hrs.	Victor Ngaira
<b>10.30 a.m.-11.00 a.m.</b>	<b>HEALTH BREAK</b>	<b>30 mins.</b>	<b>ALL</b>
11.00 a.m.–1.00 p.m.	Chicken Feeding and Feeding Equipments	2 hrs.	Victor Ngaira
<b>1.00 p.m.-2.00 p.m.</b>	<b>LUNCH BREAK</b>		<b>ALL</b>
2.00 p.m.-5.00 p.m.	Indigenous Chicken Health Management	2 hrs.	Mungube/Mutisya
<b>5.00 p.m. - 5.30 p.m.</b>	<b>HEALTH BREAK</b>	<b>30 mins.</b>	<b>ALL</b>
<b>End of Day 3</b>			
<b>Day 4: Thursday</b>	<b>Chair: Dr. Scolastica Wambua Rapporteur:</b>	<b>Period</b>	<b>Facilitator</b>
8.00 a.m. – 8.30 a.m.	Registration, Prayer	30 mins.	Gladys Wangui
8.30 a.m.– 10.30 a.m.	One Health Approach in indigenous chicken production	2 hrs.	Maichomo
<b>10.30 a.m.-11.00 a.m.</b>	<b>HEALTH BREAK</b>	<b>30 mins.</b>	<b>ALL</b>
11.00 a.m.–12.00 p.m.	Vices in Chicken production	1 hour	Mungube/Mutisya



Time	Activity	Duration	Lead/Resource Persons
12:00.–1:00 pm	Wastes Management in Chicken production	1 hrs.	Martin Mulandi
<b>1.00 p.m.-2.00 p.m.</b>	<b>LUNCH BREAK</b>		<b>ALL</b>
2.00 p.m.-4.00 p.m.	Good Agricultural Practices and Food Safety	2 hrs.	Mungube/Mutisya
4.00 p.m. - 5.00p.m.	Health Break	day	All
<i>End of Day 4</i>			
<b>Day 5: Friday</b>	<b>Chair: Dr Maichomo Rapporteur:</b>	<b>Period</b>	<b>Facilitator</b>
8.00 a.m. – 8.30 a.m.	Registration, Prayer and Recap of day 4 & 5 activities	30 mins.	
8.30 a.m.-11.00 a.m.	Role of Chicken Products in Nutrition and Value addition of eggs	2 hrs. 30 mins.	Adongo/Mercy Chelang'at
<b>11.00 - 11:30 a.m.</b>	<b>HEALTH BREAK</b>	<b>30 min.</b>	<b>ALL</b>
11.30 p.m.– 01.00 p.m.	Value addition of Chicken Meat	1 hr. 30 min.	Adongo
<b>1.00 p.m.-2.00 p.m.</b>	<b>LUNCH BREAK</b>	<b>1hr</b>	<b>ALL</b>
2.00 p.m. - 3.00 p.m.	Indigenous Chicken Business Planning and Marketing	1 hour.	Scolastica Wambua
3.00pa.m.-4.00 p.m.	Policy and Regulations in Poultry	1 hour	Ndubi
4.00 p.m.– 5.00 p.m.	Gender mainstreaming, Vulnerable, Marginalized Groups and social inclusions in the indigenous chicken value chain	1 hour.	Jessica Ndubi
<b>5.00 p.m.</b>	<b>HEALTH BREAK</b>		<b>ALL</b>
<i>End of Day 5</i>			
<b>Day 6: Saturday</b>	<b>Chair: Mr. Adongo Rapporteur:</b>	<b>Period</b>	<b>Facilitator</b>
8.00 a.m. – 8.30 a.m.	Registration, Prayer and Recap of Day 6 activities	30 mins.	
8.30 a.m.– 9.30 a.m.	Agricultural Innovation Platforms (AIPs)	1 hour	Makelo
9.30 a.m.-10.30 a.m.	Course Evaluation Presentations of County Action plans	1 hr.	Gladys Wangui
<b>10.30 a.m.-11.00 am</b>	<b>HEALTH BREAK</b>		<b>ALL</b>
11.00 a.m.-1.00 p.m.	Way Forward	2 hours	Dr. Charles Lung'aho
<b>1.00 p.m.-2.00 p.m.</b>	<b>LUNCH BREAK</b>		<b>ALL</b>

Time	Activity	Duration	Lead/Resource Persons
2.00 p.m.-4.00 p.m.	<b>Official Closing of The ToT Workshop</b> <ul style="list-style-type: none"> <li>• Remarks by the group Leader (Governor)</li> <li>• Remarks by the CPC</li> <li>• Remarks by KALRO NAVCDP coordinator- Ms. Violet Kirigua</li> <li>• Remarks by NAVCDP NPCU -Dr. Charles Lung'aho</li> <li>• Issuance of Certificates –</li> <li>• Dr. David Changwony</li> <li>• Official Closing Address by Director Livestock- Dr. David Changwony</li> <li>Closing Prayer</li> </ul>	2 hours	<b>Chair.</b> Ms. Violet Kirigua
4.00 p.m.-4.30 p.m.	<b>HEALTH BREAK</b>		<b>ALL</b>
<b>End of Day 6</b>			
<b>Day 7: Sunday</b>	Departure		<b>ALL</b>



## Annex 2: Training Reference Materials

CATEGORY/ MODULES	PUBLICATION TITLE	REFERENCE TYPES
The Indigenous Chicken Industry in Kenya and Its Economic Impact	KARI (2006) Indigenous chicken production manual. KARI Technical Note No. 18, February 2006	Manual
	Alaru, P, Mwaura, M., Wasike, C., Ngeno, K., Ouko, O, K'Oloo, T., Mwangi, S., Kamidi, C. Miyumo, S. and Ilatsia, E. (2021). KALRO Chicken management manual.	Manual
	FAO (2019). The future of livestock in Kenya: opportunities and challenges in the face of uncertainty. Nairobi, Kenya	Book
Climate Smart Agriculture practices in chicken production systems	Denmark (2017). Climate Smart Agriculture Manual for Agricultural Education in Zimbabwe, Climate Technology Centre and Network, Denmark, 2017.	Book
	FAO (2018). Climate Smart Agriculture Training Manual: A reference manual for agricultural extension agents. Food and Agricultural Organization of the United Nations, Rome, Italy	Book
	GIZ-SLM (2017). Climate Smart Agriculture: A Manual for Implementing the Sustainable Land Management Programme (SLMP). Sustainable Land Management (GIZ-SLM) Programme, Addis Ababa, Ethiopia	Manual
Farmer Field and Business School (FFBS) approach in indigenous chicken value chain	FAO (2006) Farmer Field school guidance document planning for quality programmes	Manual
	Ferris, S., Kaganzi, E., Best, R., Ostertag, C., Lundy, M. and Wandschneider, T (2008) A Market Facilitation Guide to Participatory Agroenterprise Development International Centre for Tropical Agriculture (CIAT), Cali, Colombia.	Book

Good Agricultural Practices (Gaps) and Food Safety Management Systems (FSMS) in Indigenous Chicken (IC)	FAO and OIE (2009) Guide to good farming practices for animal production food safety. Food and Agriculture Organization of the United Nations, Rome, Italy	Book
	FAO/WHO (2023) CODEX Alimentarius commission procedural manual. 28th Edition. Joint FAO/WHO food standards program	Book
Breeding and Selection of Indigenous Chicken	KARI (2012) Indigenous chicken Training manual. <a href="https://www.kalro.org/csapp/images/SPADE-CLEP-manual_July-23-small1.pdf">https://www.kalro.org/csapp/images/SPADE-CLEP-manual_July-23-small1.pdf</a>	Manual
	Alaru, P.A.O., Wangui, G., Ouko, V.O. & Miano, D (2016) Indigenous Chicken Selection and Breeding	Pamphlet
Chicken Housing and Equipment	KARI (2008) Housing of indigenous (local) chicken. KARI information brochure series / 42 /2008	Brochure
	Wachira A., Alaru P.A.O., Wangui G., Ouko V.O. & Miano D (2016) Indigenous Chicken Housing	Brochure
Chick Brooding	KARI (2012) Indigenous chicken Training manual. <a href="https://www.kalro.org/csapp/images/SPADE-CLEP-manual_July-23-small1.pdf">https://www.kalro.org/csapp/images/SPADE-CLEP-manual_July-23-small1.pdf</a>	Manual
	KARI (2006) Indigenous chicken production manual. <i>KARI Technical Note No. 18, February 2006</i> <a href="https://www.kalro.org/fileadmin/publications/tech_notes/TecNote18_20060810.pdf">https://www.kalro.org/fileadmin/publications/tech_notes/TecNote18_20060810.pdf</a>	Manual
	Wachira A., Alaru P.A.O., Wangui G., Ouko V.O. & Miano D (2016) Chick Brooding & Placement	Pamphlet



Production Systems in Indigenous Chicken	Ngeno, K., Alaru, P.A.O., Magothe, M., Wasike, C.B., Ochieng, O.V., K'Oloo, T.O., and Ilatsia, E.D. ( 2022). Growth performance of KALRO climate-smart indigenous chicken breed lines under free-range production environments.	Conference paper
	KARI (2012) Indigenous chicken Training manual. <a href="https://www.kalro.org/csapp/images/SPADE-CLEP-manual_July-23-small11.pdf">https://www.kalro.org/csapp/images/SPADE-CLEP-manual_July-23-small11.pdf</a>	Manual
Feeds and Feeding Of Indigenous Chicken	KARI (2012) Indigenous chicken Training manual. <a href="https://www.kalro.org/csapp/images/SPADE-CLEP-manual_July-23-small11.pdf">https://www.kalro.org/csapp/images/SPADE-CLEP-manual_July-23-small11.pdf</a>	Manual
	Alaru P A.O., Wangui G., Ouko V.O. Wachira A. & Miano D (2016) Feeding Indigenous Chicken	Pamphlet
Indigenous Chicken Breeder Flock Management	KARI (2006) Indigenous chicken production manual. KARI Technical Note No. 18, February 2006 <a href="https://www.kalro.org/fileadmin/publications/tech_notes/TecNote18_20060810.pdf">https://www.kalro.org/fileadmin/publications/tech_notes/TecNote18_20060810.pdf</a>	Manual
Indigenous Chicken Health Management	KARI (2006) Indigenous chicken production manual. KARI Technical Note No. 18, February 2006 <a href="https://www.kalro.org/fileadmin/publications/tech_notes/TecNote18_20060810.pdf">https://www.kalro.org/fileadmin/publications/tech_notes/TecNote18_20060810.pdf</a>	Manual
	CTA (2007) Improved Practices in Rearing Indigenous Chickens. <i>CTA Practical Guide Series, No. 4</i>	Brochure
One Health Approach for Sustainable Indigenous Chicken Production	One Health Joint Plan of Action, 2022–2026. Working together for the health of humans, animals, plants and the environment. Rome: FAO; UNEP; WHO; World Organisation for Animal Health (WOAH) (founded as OIE). 2022.	Book

Waste Management in Indigenous Chicken Production	KARI (2012) Indigenous chicken Training manual. <a href="https://www.kalro.org/csapp/images/SPADE-CLEP-manual_July-23-small11.pdf">https://www.kalro.org/csapp/images/SPADE-CLEP-manual_July-23-small11.pdf</a>	Manual
Vices in Chicken Production	Alaru P A.O., Wangui G., Ouko V.O. & Miano D (2016) Indigenous Chicken Biosecurity	Pamphlet
Nutritional Value of Chicken Meat and Eggs	FAO (2022). The state of food security and nutrition in the world.	Book
	Bordoni, Alessandra (2017). Poultry Quality Evaluation Poultry Meat Nutritive Value and Human Health. 279–290. doi:10.1016/B978-0-08-100763-1.00011-8	Book
	IPC (2022) Integrated food security Phase Classification report. (2022). IPC Acute Malnutrition Scale.	Book
Value Addition of Chicken Meat and Egg Products	Barbut, S. (2015). The Science of Poultry and Meat Processing.	Book
	Heinz, G., & Hautzinger, P. (2007). Meat processing technology for small to medium scale producers. <i>RAP Publication (FAO)</i>	Book
Incubation and Hatchery Management	Non Ruminant Research Institute. Hatching Egg Management	Leaflet
Agribusiness and Marketing	Ferris,S., Kaganzi,E., Ostertag,C., and Wicherde-cati, T,Co. (2006) A market facilitation guide to participatory agro enterprise development central internacionale de Agricultura Tropical (CIAT)	Manual
Gender, Vulnerable and Marginalized Groups, Social, Environmental Concerns and Cohesion	Sasmitha R., M. Pandiyan, M. Yuvaraj, T.Thilagavathi, M. Suganyadevi and M.Sivaji. (2020). Gender Mainstreaming and its Importance in Agriculture	Book



Agricultural Innovation Platforms	Felister Makini, Wellington Mulinge, Lawrence Mose, Beatrice Salasya, Geoffrey Kamau, Margaret Makelo, and Ong'ala, J. (2018). Impact of Agricultural Innovation Platforms on Smallholder livelihoods in Eastern and Western Kenya. FARA Research Results Vol. 2 (6) 3.	Book
	Felister. Makini, G. Kamau, M. Makelo, A. Adekunle, G. Mburathi. (2013). Operational field guide for developing and managing local agricultural innovation platforms.	Book
	Kamau, G.M. and Makini F.W. (2019). Agricultural Innovation Platforms for knowledge exchange and learning for technical, economic, social and institutional changes.	Book

### Annex 3: FFBS Learning Materials

#### **PARTICIPATORY TECHNOLOGY DEVELOPMENT (PTD) ON INDIGENOUS CHICKEN BREED SELECTION AND MANAGEMENT:**

<b>Value Chain</b>	Indigenous Chicken
<b>Learning Enterprise</b>	Indigenous Chicken
<b>Funded Enterprise</b>	Indigenous Chicken VC at production level
<b>Background Problem</b>	Low meat and egg production due to use of poor breeds
<b>Objective</b>	Increase meat and egg production through use of improved breeds.

#### **Factors to consider:**

- Indigenous Chicken of same size and age
- Same disease management system
- Use of same feeding management for all the birds
- Use of same production system

#### **Setting the P.T.D blocks:**

- Indigenous Chicken as treatments of different breeds of same age
- Each breed treatment should have 5 birds each
- Have four treatments of the KALRO 3 breeds and farmers practice
- Data collections done from each of the 5 Indigenous Chicken at the same time
- Other TIMPs should be applied for each of the Chicken equally.
- Parasitic control and disease management should also be done equally.
- **Parameters Measurement**
- Eggs Production
- Size of wings
- Weight of bird
- Size of shank

#### **Setting of Blocks**

KC1 Improved KALRO	KC2 Improved KALRO	KC3 Improved KALRO	Farmers Practice Indigenous Chicken
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**Livestock Ecosystems Analysis (LESA)**

**LESA NO .....**

**General information**

Production System .....

Laying date.....

Vaccination date.....

Time of observation: .....

Diagram of pests and natural enemies observed:

**Production data**

Weight of Bird.....

Laying %.....

Wing size.....

Size of shank.....

Natural enemies of Parasites	Parasites Observed
1	1.
2.	2
3.	3
4.	4.
Observations	Recommendations
Parasites	Control of ecto parasites
Diarrhea	Control worms, Vaccination







**National Agricultural Value Chain  
Development Project (NAVCDP)**

Ministry of Agriculture and Livestock  
Development

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