



Model Curriculum

QP Name: Beekeeper

QP Code: AGR/Q5301

Version: 4.0

NSQF Level: 3

Model Curriculum Version: 3.0

Agriculture Skill Council of India || Unit No. 101, First Floor,
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Training Parameters

Sector	Agriculture
Sub-Sector	Agriculture Allied Activities
Occupation	Beekeeping
Country	India
NSQF Level	3
Aligned to NCO/ISCO/ISIC Code	NCO-2015/6123.0101
Minimum Educational Qualification and Experience	<p>10th or equivalent</p> <p>OR</p> <p>8th class pass with 3 years of relevant experience in Agriculture and allied sectors</p> <p>OR</p> <p>Previous NSQF Level 2.5 with 1.5 years of relevant experience in Agriculture and allied sectors</p> <p>OR</p> <p>Previous NSQF Level 2 with 3 years of relevant experience in Agriculture and allied sectors</p>
Pre-Requisite License or Training	NA
Minimum Job Entry Age	16 Years
Last Review Date	18-02-2025
Next Review Date	18-02-2028
NSQC Approval Date	18-02-2025
QP Version	4.0
Model Curriculum Creation Date	18-02-2025
Model Curriculum Valid Up to Date	18-02-2028
Model Curriculum Version	3.0
Minimum Duration of the Course	270 Hours
Maximum Duration of the Course	270 Hours

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills to:

- Describe the process of preparing for and starting a beekeeping operation.
- Describe the process of inspecting and maintaining the beehives.
- Demonstrate the process of harvesting, processing and marketing honey and related produce.
- Explain the basic entrepreneurial activities for small enterprise.
- Describe the process of undertaking employability and entrepreneurial practices.
- Explain the importance of following inclusive practices for all genders and PwD at work.
- Demonstrate various practices to maintain health, hygiene and safety at the workplace.

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
AGR/N5303 Prepare for and start beekeeping operations NOS Version-4.0 NSQF Level- 3	25:00	65:00	0:00	0:00	90:00
Module 1: Introduction to the role of a Beekeeper	05:00	0:00	0:00	0:00	05:00
Module 2: Process of preparing for and starting beekeeping operations	20:00	65:00	0:00	0:00	85:00
AGR/N5304 Inspect and maintain the beehives NOS Version- 4.0 NSQF Level- 3	20:00	40:00	0:00	0:00	60:00
Module 3: Process of inspecting and maintaining the beehives	20:00	40:00	0:00	0:00	60:00
AGR/N5305 Harvest, process and market honey and related produce	30:00	30:00	0:00	0:00	60:00

NOS Version- 4.0 NSQF Level- 3					
Module 4: Process of harvesting, processing and marketing honey and related produce	30:00	30:00	0:00	0:00	60:00
AGR/N9903 Maintain health and safety at the workplace NOS Version- 4.0 NSQF Level-4	15:00	15:00	0:00	0:00	30:00
Module 5: Hygiene and cleanliness	05:00	05:00	0:00	0:00	10:00
Module 6: Safety and emergency procedures	10:00	10:00	0:00	0:00	20:00
DGT/VSQ/N0101 Employability Skills NOS Version-1.0 NSQF Level-2	30:00	00:00	0:00	0:00	30:00
Module 7: Employability Skills	30:00	00:00	0:00	0:00	30:00
Total Duration	120:00	150:00	0:00	0:00	270:00

Module Details

Module 1: Introduction to the role of a Beekeeper

Mapped to AGR/N5303 v4.0

Terminal Outcomes:

- Discuss the job role of a Beekeeper.

Duration: 05:00	Duration:0:00
Theory – Key Learning Outcome	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the size and scope of the agriculture industry and its sub-sectors. • Discuss the role and responsibilities of a Beekeeper. • Identify various employment opportunities for a Beekeeper. 	
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
NA	

Module 2: Process of preparing for and starting beekeeping operations

Mapped to AGR/N5303 v4.0

Terminal Outcomes:

- Describe the process of selecting the site and system for beekeeping.
- Describe the process of arranging the required resources and planning beekeeping operations.
- Demonstrate the process of preparing and installing beehives.
- Describe the process of selecting, procuring and introducing bees in beehives.

Duration: 20:00	Duration: 65:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain different species of bees and their life span. • Explain the role played by honeybees in biodiversity conservation and maintaining ecological balance through pollination and plant reproduction. • Explain the natural habitats of different species of bees. • Explain different modern and traditional beekeeping systems, their economic aspects and the ease of management. • Explain the criteria for selecting a beekeeping system to be used based on cost-benefit analysis. • State the appropriate climatic conditions required for beekeeping and the healthy growth of bees. • Explain different stationery and migratory beekeeping systems. • Explain the honey yield obtained from different beekeeping systems. • Explain how to conduct a cost-benefit analysis to select an appropriate beekeeping system to be followed. • Explain the importance of selecting and using cost-effective and easily available tools and equipment for beekeeping. • Explain the importance of planning beekeeping according to the 	<ul style="list-style-type: none"> • Demonstrate how to assemble the beehives using the recommended type of wood and other relevant materials. • Demonstrate the process of applying the paint of recommended colour on the beehives. • Demonstrate the process of setting up the queen excluder as per the requirement. • Demonstrate the process of installing the beehives with rectangular frames inside them, and stacking them on wooden stands. • Show how to hang beehives as planned using strong and greased galvanised wires. • Demonstrate how to clean the beehives thoroughly before introducing bees in them. • Demonstrate the process of setting up beehives using painted iron stands • Demonstrate how to move hives to various locations to support pollination of crops •

flowering season.

- Explain the criteria for selecting a site for beekeeping.
- Explain the importance of selecting a location for beekeeping that consists of diverse vegetation and provides adequate pollen, nectar and water for bee feed.
- Explain the importance of ensuring the presence of nectar and pollen yielding flowers in the recommended quantity near the site, along with trees for shading and a source of clean water.
- Explain the importance of ensuring the site selected for beekeeping does not experience intense heat, cold and rains and waterlogging.
- Explain the use of various tools, equipment, PPE and accessories required for beekeeping, such as top bar hive/ Langstroth hive, smoker, honey extractor, comb foundation sheet, de-capping knife, bee brush, feeder, etc.
- Explain the importance of selecting a location for the installation of beehives within the recommended distance from the flower field/ forest.
- Describe the process of assembling beehives using the recommended type of wood and other relevant materials.
- State the appropriate paint colour to be applied on beehives according to the temperature of the region to maintain the temperature in beehives.
- Explain the criteria for selecting the appropriate species of bee for apiculture.
- Describe the process of procuring the package of selected bee species, ensuring the presence of queen bees, worker bees and male bees in the required number.

<ul style="list-style-type: none"> • Describe the process of catching bees from the wild. • Explain the importance of cleaning the beehives thoroughly before introducing bees in them. • Describe the process of introducing bees in beehives following the recommended procedure, maintaining the recommended number of bees in each beehive. • Analyse the floral calendar with respect to the location • Discuss the process of collaboration with local farmers to place hives near fields 	
Classroom Aids	
Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop	
Tools, Equipment and Other Requirements	
Hive Uncapping Knife, Hive Tool, Bee Brush, Honey Extractor, Propolis Collector, Pollen Collector, etc.	

Module 3: Process of inspecting and maintaining the beehives

Mapped to ARG/N5304 v4.0

Terminal Outcomes:

- Describe the process of inspecting and managing the beehives.
- Demonstrate the process of performing pest, disease and nuisance management.
- Demonstrate various practices for effective resource optimisation.
- Demonstrate various waste management practices.

Duration: 20:00	Duration: 40:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the process of inspecting beehives using the relevant PPE. • Explain the signs of swarming and absconding in beehives and the appropriate preventive measures to be taken. • Explain how to identify the need of installing additional frames and honeycomb foundations in beehives. • Explain the importance of ensuring effective drainage at the apiary site. • Describe the method for mass rearing of the queen bee. • Explain the importance of ensuring the availability of bee pasturage or bee forage in an adequate quantity for the survival and healthy growth of bees. • Describe the process of removing unnecessary and deformed honeycombs, ensuring no damage to other honeycombs. • Explain the recommended practices to be followed to preserve honeycombs during the dearth period. • Explain the importance of ensuring appropriate shading from trees or through artificial means to protect bees from the intense heat. • Explain the need of covering the beehives with gunny bags or rice straw and sprinkling them with the recommended quantity of water to regulate the temperature in 	<ul style="list-style-type: none"> • Demonstrate how to clean the beehives following the recommended procedure and using the appropriate tools and equipment. • Demonstrate how to remove unnecessary and deformed honeycombs, ensuring no damage to other honeycombs. • Demonstrate the process of carrying out winter packaging with the recommended material such as tar paper during periods of below normal temperatures. • Demonstrate the process of preparing sugar syrup and pollen to feed bees during the dearth period. • Show how to feed the bee colonies with sugar syrup, pollen supplement, water and other recommended feed during the dearth period. • Show how to unite the smaller colonies to enlarge colonies or divide large colonies to populate new beehives, using the relevant tools and equipment. • Demonstrate how to prepare the bee colonies for the production of royal jelly. • Demonstrate the use of a queen excluder to keep the queen out of the super chamber to ensure the quality of honey. • Demonstrate the process of applying the recommended treatment as per the prescription to beehives to

<p>beehives during summer.</p> <ul style="list-style-type: none"> • Explain the need for winter packaging and the recommended material to be used for that such as tar paper. • Describe the process of uniting the smaller colonies to enlarge colonies and dividing large colonies to populate new beehives, using the relevant tools and equipment. • State the recommended practices to be followed to prevent dampness during the rainy season. • Explain the importance of ensuring no empty space in beehives during the swarming season. • Explain the use of a queen excluder to keep the queen out of the super chamber to ensure the quality of honey. • Explain the relevant preventive practices to be followed to prevent pests and disease infestation in beehives. • State the signs of relevant pests and diseases that infest beehives such as wax moth, varroa mite, ant, termites, European foul brood, American foul brood, sac brood, etc. • Explain the importance of maintaining the record of inspection of beehives and treatment applied to them. • Explain the recommended practices to be followed to prevent different types of a nuisance to bees such as domestic animals, honey badgers, birds, vandals, etc. • Explain the benefits of resource optimisation. • Explain the importance of recycling and disposing different types of waste as per the applicable regulations. • Explain different development stages of different types of bees and the 	<p>remove the identified pests and diseases.</p> <ul style="list-style-type: none"> • Prepare a sample record of inspection of beehives and treatment applied to them. • Demonstrate various practices to optimise the usage of various resources such as water and electricity. • Demonstrate the process of recycling and disposing different types of waste appropriately. • Demonstrate the inspection process of hives for brood pattern, honey storage and general colony. • Demonstrate process of cleaning and replacing the damaged combs
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time taken at each stage.

- Explain different types of raw produce generated by bees during their life cycle.
- Describe different communication methods used by bees such as producing odour, drumming feet, flapping wings, etc.
- Explain how bees locate their food source.
- State the conditions under which bees abandon their existing hives and create new hives.
- List various bee forage plants and the process and timing of their flowering.
- State various ways to protect bees and beehives during the dearth period, and intense heat and cold.
- Explain various recommended practices to be followed for the conservation of bees and beehives.
- Explain how to fix the radius of apiary location from food sources.
- Explain the importance of keeping the beehives clean and pest free.
- Explain the importance of ensuring beehives are stable and easily accessible.
- Explain how to reduce drifting and disease transmission.
- Explain the importance of ensuring effective drainage and no dampness at the site of apiculture.
- Describe the process of feeding the bee colonies during the dearth period.
- Explain how to rear the queen bee.
- State the recommended precautions to be taken while dividing and uniting bee colonies.
- Explain the use of relevant tools and equipment for dividing and uniting bee colonies.

- Explain how to manage bee colonies during summer, winter and monsoon.
- Explain the importance of using the relevant PPE while inspecting beehives such as bee suits, gloves and shoes.
- State the signs of healthy growth of bees and optimum production of honey.
- State the signs of pests, disease and abnormal behaviour in bees.
- Explain the symptoms of swarming and absconding in bees and how to deal with it.
- Explain the need to install additional frames and honeycomb foundation in beehives.
- Explain the importance and process of removing unnecessary and deformed honeycombs.
- State the recommended precautions to be taken while applying pesticide or insecticide to beehives.
- State various practices to be followed to prevent infection and contamination at the site of beekeeping.
- Explain the importance of positioning beehives appropriately.
- Explain the use of different beekeeping equipment used in colony management such as a smoker, hive tool, bee brush, etc.
- Explain the importance of protecting beehives from intense heat, cold, strong winds, and various nuisance.
- State the recommended pesticides and insecticides to control pests and disease in beehives and the relevant application methods.
- Explain the bee colony collapse disorder and how to prevent and deal with it.
- Explain how to prevent and treat

<p>poisoning caused by pesticides, insecticides and other chemicals.</p> <ul style="list-style-type: none"> • List various tools and equipment used in insect, diseases and nuisance management. • State the applicable preventive practices to be followed to prevent insects, diseases and nuisance in bee colonies. • Explain the importance of using natural remedies or approved medications for disease and mite control • Discuss management practices to help protect bees from pesticide poisoning 	
Classroom Aids	
Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop	
Tools, Equipment and Other Requirements	
All Personal Protective Equipment Required While Handling Bees, Smoker, Bee Suite and Gloves, Royal Jelly Extractor, Venom Extractor, etc.	

Module 4: Process of harvesting, processing and marketing honey and related produce

Mapped to AGR/N5305 v4.0

Terminal Outcomes:

- Demonstrate the process of harvesting honey and other bee produce
- Demonstrate the process of grading and storing the produce
- Describe the process of marketing the produce

Duration: 30:00	Duration: 30:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the importance and process of identifying the honeycombs containing ripe honey which are sealed, with a fine layer of beeswax. • State the appropriate time for harvesting honey and other raw produce. • Explain the importance of ensuring no harm to bees during the extraction process. • Explain the recommended practices to be followed to protect honey and other produce from contamination during extraction. • Explain the applicable grading and sorting parameters such as ripeness, colour, taste, purity for grading honey and other produce. • State the appropriate storage requirements for packed honey and other produce. • State the potential buyers and markets for honey and other bee produce, such as e-Mandi, local traders, exporters, etc. • Explain the importance and process of negotiating with the buyers to secure a profitable price for the produce. • State the appropriate mode of transport to be used for safe and hygienic delivery of honey and other produce to the buyer. • Discuss precautionary measures to 	<ul style="list-style-type: none"> • Demonstrate the use of the relevant tools and equipment for extracting honey and related produce such as hive tool, smoker, honey extractor, etc. • Demonstrate the process of the process of extracting honey, propolis, pollen, royal jelly and bee venom from honeycombs safely, using the recommended PPE. • Demonstrate the process of unfreezing honeycombs and filtering the melted honeycombs to obtain yellow beeswax. • Describe the process of bleaching the yellow beeswax with the recommended oxidizing agent such as hydrogen peroxide, sulphuric acid, or sunlight to obtain white beeswax. • Show how to collect the extracted produce in separate and clean containers, protecting it from contamination. • Show how to grade honey and other produce based on applicable grading parameters such as ripeness, colour, taste, purity, etc. • Demonstrate how to sort out the produce based on their shelf-life. • Demonstrate the process of packing honey and other produce in suitable packaging and labelling it with the relevant information. • Demonstrate how to process the payment using the buyer-preferred

<p>prevent getting bee stings</p> <ul style="list-style-type: none"> • Discuss the process of ensuring traceability of the source of honey by tagging a GPS location with the harvested honey 	<p>e-payment method.</p> <ul style="list-style-type: none"> • Prepare a sample manual and/ or electronic record of sales and payments using the physical registers and/ or the relevant computer application. • Demonstrate developing branding and packaging for premium honey or organic certification • Document logs of colony strength, queen replacement, honey yields, and pest/disease management • Demonstrate how to track expenses nad income from the bee farm
Classroom Aids	
Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop	
Tools, Equipment and Other Requirements	
Mass Queen Rearing Kits, Grafting Needle, Queen Excluder, Queen Cage etc.	

Module 5: Hygiene and cleanliness

Mapped to NOS AGR/N9903 v4.0

Terminal Outcomes:

- Discuss how to adhere to personal hygiene practices.
- Demonstrate ways to ensure cleanliness around the workplace.

Duration: 05:00	Duration: 05:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the requirements of personal health, hygiene and fitness at work. • Describe common health-related guidelines laid down by the organizations/ Government at the workplace. • Explain the importance of good housekeeping at the workplace. • Explain the importance of informing the designated authority on personal health issues related to injuries and infectious diseases. 	<ul style="list-style-type: none"> • Demonstrate personal hygiene practices to be followed at the workplace. • Demonstrate the correct way of washing hands using soap and water, and alcohol-based hand rubs. • Demonstrate the steps to follow to put on and take off a mask safely. • Show how to sanitize and disinfect one's work area regularly. • Demonstrate adherence to the workplace sanitization norms. • Show how to ensure the cleanliness of the work area.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and Software, Facilitator's Guide, Participant's Handbook.	
Tools, Equipment and Other Requirements	
Personal Protective Equipment, Cleaning Equipment and Materials, Sanitizer, Soap, Mask	

Module 6: Safety and emergency procedures

Mapped to NOS AGR/N9903 v4.0

Terminal Outcomes:

- Describe how to adhere to safety guidelines.
- Show how to administer appropriate emergency procedures.

Duration: 10:00	Duration: 10:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • List the Personal Protective Equipment (PPE) required at the workplace. • Describe the commonly reported hazards at the workplace. • Describe the hazards caused due to chemicals/pesticides/fumigants. • Describe the basic safety checks to be done before the operation of any equipment/machinery. • Describe the common first aid procedures to be followed in case of emergencies. • State measures that can be taken to prevent accidents and damage s at the workplace. • Explain the importance of reporting details of first aid administered, to the reporting officer/doctor, in accordance with workplace procedures. • State common health and safety guidelines to be followed at the workplace. 	<ul style="list-style-type: none"> • Check various areas of the workplace for leakages, water-logging, pests, fire, etc. • Demonstrate how to safely use the PPE and implements it as applicable to the workplace. • Display the correct way of donning, doffing and discarding PPE such as face masks, hand gloves, face shields, PPE suits, etc. • Sanitize the tools, equipment and machinery properly. • Demonstrate the safe disposal of waste. • Demonstrate procedures for dealing with accidents, fires and emergencies. • Demonstrate emergency procedures to the given workplace requirements. • Demonstrate the use of emergency equipment in accordance with manufacturers' specifications and workplace requirements. • Demonstrate the administration of first aid. • Prepare a list of relevant hotline/ emergency numbers.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and Software, Facilitator's Guide, Participant's Handbook.	
Tools, Equipment and Other Requirements	
Personal Protective Equipment, First Aid Kit, Equipment used in Medical Emergencies.	

Module 7: Employability Skills (30 hours)

Mapped to NOS DGT/VSQ/N0101 v1.0

Duration: 30:00

Key Learning Outcomes

Introduction to Employability Skills Duration: 1 Hour

After completing this programme, participants will be able to:

1. Discuss the importance of Employability Skills in meeting the job requirements

Constitutional values - Citizenship Duration: 1 Hour

2. Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen.
3. Show how to practice different environmentally sustainable practices

Becoming a Professional in the 21st Century Duration: 1 Hours

4. Discuss 21st century skills.
5. Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mindset in different situations.

Basic English Skills Duration: 2 Hours

6. Use appropriate basic English sentences/phrases while speaking

Communication Skills Duration: 4 Hour

7. Demonstrate how to communicate in a well -mannered way with others.
8. Demonstrate working with others in a team

Diversity & Inclusion Duration: 1 Hour

9. Show how to conduct oneself appropriately with all genders and PwD
10. Discuss the significance of reporting sexual harassment issues in time

Financial and Legal Literacy Duration: 4 Hours

11. Discuss the significance of using financial products and services safely and securely.
12. Explain the importance of managing expenses, income, and savings.
13. Explain the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws

Essential Digital Skills Duration: 3 Hours

14. Show how to operate digital devices and use the associated applications and features, safely and securely
15. Discuss the significance of using internet for browsing, accessing social media platforms, safely and securely

Entrepreneurship Duration: 7 Hours

16. Discuss the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges

Customer Service Duration: 4 Hours

17. Differentiate between types of customers
18. Explain the significance of identifying customer needs and addressing them
19. Discuss the significance of maintaining hygiene and dressing appropriately

Getting ready for apprenticeship & Jobs Duration: 2 Hours

20. Create a biodata
21. Use various sources to search and apply for jobs
22. Discuss the significance of dressing up neatly and maintaining hygiene for an interview
23. Discuss how to search and register for apprenticeship opportunities

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
12th Class	Science	5	Agriculture/ Bee Biology/ Entomology/ Apiculture related activities	0		Ex-Service-Man including Ex-Paramilitary personnel: Minimum Qualification is 10+2 with an Honourable Discharge/ Pension. SSC would consider a relaxation/waiver of sector-specific experience on a case-to-case basis. Class 12th with Science (With any Government Certificate Program in Bee Keeping/ Apiculture)
Diploma	Agriculture / Bee Keeping	3	Agriculture/ Bee Biology/ Entomology/ Apiculture related activities	0		
Graduate	Graduate in any stream except Agriculture / Horticulture / Entomology & Apiculture and related streams	2	Agriculture/ Bee Biology/ Entomology/ Apiculture related activities	0		For the school Program minimum qualification of the Trainer should be Graduate (Zoology/Agriculture / Horticulture / Entomology & Apiculture and related streams) with minimum 3 years Teaching experience (will be considered industry experience)
Graduate	Agriculture/ Horticulture/ Entomology & Apiculture and related streams	1	Agriculture/ Bee Biology/ Entomology/ Apiculture related activities	0		
Post-Graduate	Agriculture/ Horticulture/ Entomology & Apiculture and related streams	0		0		

Trainer Certification	
Domain Certification	Platform Certification
Certified for Job Role “Beekeeper”, mapped to QP: “AGR/Q5301, v4.0”, Minimum accepted score is 80%	Recommended that the Trainer is certified for the Job Role: “Trainer (Vet and Skills)”, mapped to the Qualification Pack: “MEP/Q2601, v2.0”. The minimum accepted score as per MEPSC guidelines is 80%.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
B.Sc.	Agriculture/ Environmental Science/ Entomology and related streams	5	Agriculture/ Bee Biology/ Entomology/ Apiculture and related experience	0		Practical skills and knowledge required in Beekeeping/ Apiculture
M.Sc.	Agriculture/ Environmental Science/ Entomology and related streams	2	Agriculture/ Bee Biology/ Entomology/ Apiculture and related experience	0		Practical skills and knowledge required in Beekeeping/ Apiculture
PhD	Agriculture/ Environmental Science/ Entomology and related streams	1	Agriculture/ Bee Biology/ Entomology/ Apiculture and related experience	0		Practical skills and knowledge required in Beekeeping/ Apiculture
Assessor Certification						
Domain Certification				Platform Certification		
Certified for Job Role “Beekeeper”, mapped to QP: “AGR/Q5301, v4.0”, Minimum accepted score is 80%				Certified for the Job Role: “Assessor (Vet and Skills)”, mapped to the Qualification Pack: “MEP/Q2701, v2.0”, with a minimum score of 80%.		

Assessment Strategy

Assessment System Overview

In Agriculture Sector it is of ultimate importance that individuals dealing with crop production or livestock have the requisite knowledge and competencies to undertake the task. Based on the Assessment Criteria, SSC in association with empaneled AAs, define the test structure for the given job roles to cover the required skills and competencies. Assessment strategy consists of the following:

1. Multiple Choice Questions: To assess basic knowledge (Objective/Subjective)
2. Viva: To assess awareness on processes (Oral and/or written questioning)
3. Practical: To evaluate skills and identify competencies. (Observation)

Assessments for knowledge and awareness on processes may be conducted through 'real-time' internet-based evaluation or by conducting the same 'offline' through TABs. Skills and competencies are to be assessed by conducting 'practical' on the ground through qualified and ToA certified assessors.

An individual must have adequate knowledge and skills to perform a specific task, weightage for different aspects of the assessment is given as follows:

- Multiple Choice Questions: 20%-30%, depending on the specific QP
- Viva: 20%
- Practical: 50% - 60% (Involves demonstrations of applications and presentations of procedures/tasks and other components)
- Assessment will be carried out by certified assessors through empaneled assessment partners. Based on the results of the assessment; ASCI will certify the learners/candidates

Testing Environment

Assessments are conducted on laptops, Mobiles and android tablets via both offline and online mode depending on the internet connectivity at the assessment location.

In remote locations/villages, assessments get delivered through tablets without the requirement of the Internet.

- Multilingual assessments (ASCI is conducting the assessments in 13 + languages pan India)
- Rubric driven assessments in Practical/Viva sections and responses recorded accordingly
- All responses, data, records and feedback are stored digitally on the cloud
- Advanced auto-proctoring features – photographs, time-stamp, geographic-tagging, toggle- screen/copy-paste disabled, etc.
- Android-based monitoring system
- End to end process from allocation of a batch to final result upload, there is no manual intervention

- Assessment will normally be fixed for a day after the end date of the training / within 7 days of completion of training.
- Assessment will be conducted at the training venue
- The room where assessment is conducted will be set with proper seating arrangements with enough space to curb copying or other unethical activities
- Question bank of theory and practice will be prepared by ASCI /assessment agency and approved ASCI. Only from approved Question Bank assessment agency will prepare the question paper. Theory testing will include multiple-choice questions, pictorial questions, etc. which will test the trainee on his theoretical knowledge of the subject.
- The theory, practical and viva assessments will be carried out on the same day. In case of a greater number of candidates, the number of assessors and venue facilitation be increased and facilitated

Assessment			
Assessment Type	Formative or Summative	Strategies	Examples
Theory	Summative	MCQ/Written exam	Knowledge of facts related to the job role and functions. Understanding of principles and concepts related to the job role and functions
Practical	Summative	Structured tasks/Demonstration	Practical application /Demonstration /Application tasks
Viva	Summative	Questioning and Probing	Mock interviews on the usability of job roles/advantages /importance of adherence to procedures. Viva will be used to gauge trainee's confidence and correct knowledge in handling the job situation

The question paper is pre-loaded in the computer /Tablet and it will be in the language as requested by the training partner.

Assessment Quality Assurance framework

Assessment Framework and Design:

Based on the Assessment Criteria, SSC in association with AAs will define the test structure for the given roles to cover the required skills and competencies. ASCI offer a bouquet of tools for multi-dimensional evaluation of candidates covering language, cognitive skills, behavioural traits and domain knowledge.

Theoretical Knowledge - Item constructs and types are determined by a theoretical understanding of the testing objectives and published research about the item types and constructs that have shown statistical validity towards measuring the construct. Test item types that have been reported to be coachable are not included. Based on these, items are developed by domain experts. They are provided with comprehensive guidelines of the testing objectives of each question and other quality measures.

Type – Questions based on Knowledge Required, Case-based practical scenario questions and automated simulation-based questions.

Practical Skills - The practical assessments are developed taking into consideration two aspects: what practical tasks is the candidate expected to perform on the job and what aspects of the job cannot be judged through theoretical assessments. The candidates shall be asked to perform either an entire task or a set of subtasks depending on the nature of the job role

Type – Standardized rubrics for evaluation against a set of tasks in a demo/practical task

Viva Voce - Those practical tasks which cannot be performed due to time or resource constraints are evaluated through the viva mode. Practical tasks are backed up with Viva for thorough assessment and complete evaluation

Type – Procedural questions, dos and don'ts, subjective questions to check the understanding of practical tasks.

The assessor has to go through an orientation program organized by the Assessment Agency. The training would give an overview to the assessors on the overall framework of QP evaluation. The assessor shall be given a NOS and PC level overview of each QP as applicable. The overall structure of assessment and objectivity of the marking scheme will be explained to them. The giving of marks will be driven by an objective framework that will maintain the standardization of the marking scheme.

Type of Evidence and Evidence Gathering Protocol:

During the assessment the evidence collected by AAs and ASCI are:

- Geo Tagging to track ongoing assessment
- AA's coordinator emails the list of documents and evidence (photos and videos) to the assessor one day before the assessment. The list is mentioned below:
 - Signed Attendance sheet
 - Assessor feedback sheet

- Candidate feedback sheet
 - Assessment checklist for assessor
 - Candidate Aadhar/ID card verification
 - Pictures of the classroom, labs to check the availability of adequate equipment's and tools to conduct the training and assessment
 - Pictures and videos of Assessment, training feedback and infrastructure.
- Apart from the Assessor, a Technical assistant is popularly known as Proctor also ensures the proper documentation and they verify each other's tasks.
- To validate their work on the day of the assessment, regular calls and video calls are done.
- On-boarding and training of the assessor and proctor are done on a timely basis to ensure that the quality of the assessment should be maintained.
- Training covers the understanding of QP, NSQF level, NOS and assessment structure

Methods of Validation

- Morning Check (Pre-Assessment): Backend team of AA calls and confirms assessor/technical SPOC event status. Assessor/Technical SPOC are instructed to reach the centre on time by 9:30 AM / as decided with TC and delay should be highlighted to the Training Partner in advance.
- Video Calls: Random video calls are made to the technical SPOC/assessor so as to keep a check on assessment quality and ensure assessment is carried out in a fair and transparent manner
- Aadhar verification of candidates
- Evening Check (Post Assessment): Calls are made to the ground team to ensure the event is over by what time and the documentation is done properly or not.
- TP Calling: To keep a check on malpractices, an independent audit team calls the TP on a recorded line to take confirmation if there was any malpractice activity observed in the assessment on part of the AA/SSC team. If calls are not connected, an email is sent to TP SPOC for taking their confirmation
- Video and Picture Evidence: Backend team collects video and pictures for assessment on a real-time basis and highlights any issue such as students sitting idle/ trainer helping the candidates during the assessment.
- Surprise Visit: Time to time SSC/AA Audit team can visit the assessment location and conduct a surprise audit for the assessment carried out by the ground team.
- Geo Tagging: On the day of the assessment, each technical SPOC is required to login into our internal app which is Geotagged. Any deviation with the centre address needs to be highlighted to the assessment team on a real-time basis.

Method for assessment documentation, archiving, and Access:

- ASCI have a fully automated result generation process in association with multiple AAs
- Theory, Practical and Viva marks form the basis of the results and encrypted files generated to avoid data manipulation. All responses were captured and stored in the

System with Time-Stamps at the end of AAs and SSC. NOS-wise and PC-wise scores can be generated.

- Maker Checker concept: One person prepares the results and another audit result which is internally approved by AA at first and then gets vetted at the end of SSC
- All softcopies of documents are received from the on-ground tech team over email. The same is downloaded by our internal backend team and saved in Repository. The repository consists of scheme-wise folders. These scheme-wise folders have two job role-specific folders. These specific folders have Year wise and Month wise folders where all documents are saved in Batch specific folders. All Hard copies are filed and stored in the storeroom.

Result Review & Recheck Mechanism –

- Time-stamped assessment logs
- Answer/Endorsement sheets for each candidate
- Attendance Sheet
- Feedback Forms: Assessor feedback form, Candidate feedback form, TP feedback form
- The results for each of the candidates shall be stored and available for review (retained for 5 years/ till the conclusion of the project or scheme)

References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	The Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on-site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on-site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	The Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training.
Terminal Outcome	The Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module. A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

Term	Description
AEPS	Aadhar Enabled Payment System
AGR	Agriculture
NOS	National Occupational Standard (s)
NSQF	National Skills Qualifications Framework
OJT	On-the-job Training
PwD	People with Disability
PPE	Personal Protective Equipment
QP	Qualifications Pack
UPI	Unified Payment Interface
USSD	Unstructured Supplementary Service Data