Model Curriculum

QP Name: Assistant Greenhouse Operator

QP Code: AGR/Q1009

Version: 1.0

NSQF Level: 2

Model Curriculum Version: 1.0

Agriculture Skill Council of India || Unit No. 101, First Floor, Greenwoods Plaza, Block 'B', Greenwoods City, Sector 45, Gurugram -122009, Haryana.

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Training Parameters

Sector	Agriculture
Sub-Sector	Agriculture Crop Production
Occupation	Precision Farming
Country	India
NSQF Level	2
Aligned to NCO/ISCO/ISIC Code	NCO-2015/6113
Minimum Educational Qualification and Experience	No formal education
Pre-Requisite License or Training	NA
Minimum Job Entry Age	NA
Last Reviewed On	29/09/2023
Next Review Date	29/09/2026
NSQC Approval Date	29/09/2023
QP Version	1.0
Model Curriculum Creation Date	27/10/2023
Model Curriculum Valid Up to Date	29/09/2026
Model Curriculum Version	1.0
Minimum Duration of the Course	210 Hours
Maximum Duration of the Course	210 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:

- Demonstrate the process of assisting in setting up a greenhouse.
- Demonstrate the process of carrying out greenhouse operations and maintaining the greenhouse.
- Describe the process of undertaking employability and entrepreneurial practices.

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/N1040: Assist in setting up of greenhouse **NOS Version- 1.0** **NSQF Level- 2**	**40:00**	**50:00**	**0:00**	**0:00**	**90:00**
Bridge Module Module 1: Introduction tothe role of a Greenhouse Assistant Operator	05:00	0:00	0:00	0:00	05:00
Module 2: Process of assisting in setting up the garden	35:00	50:00	0:00	0:00	85:00
AGR/N1041: Carry out operations and maintenance of greenhouse **NOS Version- 1.0** **NSQF Level- 2**	**30:00**	**60:00**	**0:00**	**0:00**	**90:00**
Module 3: Process of carrying out operations and maintenance of the greenhouse	30:00	60:00	0:00	0:00	90:00
DGT/VSQ/N0101: Employability Skills **NOS Version-1.0** **NSQF Level-2**	**30:00**	**00:00**	**0:00**	**0:00**	**30:00**
Module 4: Employability Skills	30:00	00:00	0:00	0:00	30:00
Total Duration	**100:0**	**110:00**	**0:00**	**0:00**	**210:00**

Module Details

Module 1: Introduction to the role of a Greenhouse Assistant Operator

Bridge Module, Mapped to AGR/N1040 v1.0

Terminal Outcomes:

- Discuss the job role of a Greenhouse Assistant Operator .

Duration: 5:00	**Duration: 0:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the size and scope of the agriculture industry and its sub-sectors. • Discuss the role and responsibilities of a Greenhouse Assistant Operator. • Identify various employment opportunities for a Greenhouse Assistant Operator.	
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
NA	

Module 2: Process of assisting in setting up the greenhouse

Mapped to AGR/N1040 v1.0

Terminal Outcomes:

- Demonstrate the process of assisting in setting up different types of greenhouse.
- Demonstrate various practices for effective resource optimisation.

Duration: 35:00	**Duration: 50:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain different types of greenhouse such as the lean-to, even or uneven span, ridge and furrow, sawtooth, etc. • Explain the criteria for selecting a particular type of greenhouse to be set up such as the climate, topography, sunlight exposure, market accessibility, etc. • List various materials required for setting up a greenhouse according to the type selected. • Explain the importance of ensuring good air circulation, adequate sunlight exposure while installing the greenhouse. • Explain the importance of arranging for safe drainage of excess water from the greenhouse and its protection from external threats such as stray animals, whiteflies, rodents, etc. • Explain the benefits of resource optimisation.	• Demonstrate the process of taking measurements and preparing the layout of the greenhouse through co-ordination with the greenhouse installer. • Show how to level the land as per the installer's instructions before the installation of the greenhouse. • Demonstrate the process of preparing the greenhouse structure and erecting it as per the prepared layout through co-ordination with the greenhouse installer. • Demonstrate the process of installing the relevant temperature and humidity control equipment. • Demonstrate the process of installing the appropriate glazing material as per the plan. • Demonstrate the process of installing the irrigation or fertigation system. • Demonstrate various practices to optimise the usage of various resources such as water and electricity.
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Benches, Tables and Plant Carts used in the production area; Containers (including Flats and Pots) for Plants; Greenhouse Equipment	

Module 3: Process of carrying out operations and maintenance of the greenhouse

Mapped to AGR/N1041 v1.0

Terminal Outcomes:

- Demonstrate the process of planting and maintaining seeds, vegetables and plants.
- Demonstrate the process of harvesting, acclimatising and transplanting seedlings and plants.
- Demonstrate the process of harvesting the flowers and vegetables.
- Demonstrate the process of carrying out post-harvest processing and marketing of flowers and vegetables.
- Describe the process of maintaining the greenhouse.
- Demonstrate various waste management practices.
- Discuss ways to promote diversity and inclusion at the workplace.

Duration: 30:00	**Duration: 60:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• State the water requirements of different types of seeds, vegetables, flowers and plants. • List signs of pests and disease in the seedlings, vegetables, flowers and plants. • Explain the importance of maintaining the recommended temperature, humidity and sunlight exposure in the greenhouse. • Explain the importance of storing the harvested flowers and vegetables at the recommended temperature, humidity and hygienic conditions. • Explain post-harvest processing and marketing of flowers and vegetables i.e. sorting and grading, cleaning and marketing. • Explain the importance of maintaining cleanliness in the greenhouse. • Explain the criteria for segregating waste into appropriate categories. • Explain the procedure to report inappropriate behaviour e.g., harassment.	• Demonstrate the process of preparing the raised, flat or sunken bed in the greenhouse. • Demonstrate the process of planting seeds, vegetables and different types of plants in the greenhouse. • Show how to water the planted seeds, vegetables, flowers and plants with the recommended quantity. • Demonstrate the process of applying fertilizers in the recommended quantity to promote the healthy growth of seedlings, vegetables and plants. • Demonstrate the process of applying the recommended pesticides and insecticides to control pest and disease infestation. • Show how to remove the dead and damaged seedlings, vegetables, flowers and plants. • Demonstrate how to apply herbicides and weedicides and carry out manual weeding to prevent unwanted growth in the greenhouse. • Demonstrate the process of carrying out repair and maintenance of the irrigation or fertigation system. • Prepare a sample manual and/ or

	electronic record of herbicides, weedicides fertilizers, pesticides and insecticides used in the greenhouse. • Demonstrate the process of harvesting the seedlings and plants. • Show how to acclimatise the seedlings and plants under the recommended temperature, protecting them from harsh conditions. • Show how to transplant the acclimatised seedlings and plants in the garden. • Demonstrate the process of harvesting the flowers and vegetables using the appropriate tools. • Demonstrate the process of carrying out sorting and grading the flowers and vegetables. • Show how to clean the vegetables using clean water and recommended cleaning agents. • Demonstrate the process of preparing the hydration solution and applying it to the flowers to maintain their freshness. • Demonstrate how to process the payments using the appropriate e-payment methods. • Prepare a sample record of sales and payments using the physical registers and/ or the relevant computer application. • Demonstrate the process of cleaning the greenhouse through sweeping and removal of the trash. • Demonstrate the process of carrying out repair and maintenance of the greenhouse structure. • Demonstrate the process of recycling and disposing different types of waste appropriately. • Demonstrate appropriate verbal and non-verbal communication that is

	respectful of genders and disability.
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Plant Markers; Spraying Equipment for the application of Insecticides, Herbicides, Fungicides and Fertilisers; Water Equipment including Sprinkler System, Pumps, Distribution Lines, Hoses, Nozzles, Fertiliser Injectors and Propagation Misters, Sickle, Hoe, Khurpa, Spade, Hand Trowel, Cocopeat; Compost/ Vermicompost	

Module 4: 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	Science	5	Operation of Greenhouse	0		Ex-Serviceman including Ex-Paramilitary personnel: Minimum Qualification is 10+2 with an honorable discharge/pension SSC would consider a relaxation/wavier of sector specific experience on case-to-case basis.
Diploma	Civil/ Mechanical/ Fitter	3	Operation of Greenhouse	0		
ITI	Civil/ Mechanical/ Fitter	3	Operation of Greenhouse	0		
Graduate	Graduate in any stream except Agriculture/ Horticulture/ Botany/ Forestry	2	Operation of Greenhouse	0		Graduate in any stream (with 10+2 inscience. For the school Program minimum qualification of the Trainer should be Graduate (Agriculture / Horticulture / Botany/ Forestry) with minimum 3 years Teaching experience (will be considered industry experience)
Graduate	Agriculture/ Horticulture/ Botany/ Forestry	1	Operation of Greenhouse	0		
B. Tech	Mechanical/ Civil	0.5	Operation of Greenhouse	0		
B. Tech	Agriculture Engineering	0		0		s
Certificate	Relevant CITS-NCIC Course	1	Operation of Greenhouse	0		

Trainer Certification	
Domain Certification	**Platform Certification**
Certified for Job Role "**Assistant Greenhouse Operator**", mapped to QP: "AGR/Q1009, v1.0", 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***	
Graduation	Agriculture/Horticulture/ Botany/ Forestry/ Agriculture Engineering/ Farm Engineering and related streams	5	Agriculture/ Forestry/ Agronomy/ Horticulture/ Farm Engineering/ Agriculture engineering and related experience	0		Practical skills and knowledge required in Greenhouse Operation
Post-Graduation	Agriculture/ Farm Engineering/ Agriculture Engineering/ Botany/ Forestry/ Agronomy and related streams	2	Agriculture/ Forestry/ Agronomy/ Horticulture/ Farm Engineering/ Agriculture engineering and related experience	0		Practical skills and knowledge required in Greenhouse Operation
PhD	Agriculture/ Botany/ Forestry/ Agronomy/ Agriculture engineering/ Farm Engineering and related streams	1	Agriculture/ Forestry/ Agronomy/ Horticulture/ Farm Engineering/ Agriculture engineering and related experience	0		Practical skills and knowledge required in Greenhouse Operation

Assessor Certification	
Domain Certification	**Platform Certification**
Certified for Job Role "**Assistant Greenhouse Operator**", mapped to QP: "AGR/Q1009, v1.0", 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 asrequested 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 swise 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	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
AGR	Agriculture
NOS	National Occupational Standard (s)
NSQF	National Skills Qualifications Framework
OJT	On-the-job Training
QP	Qualifications Pack
PwD	People with Disability
PPE	Personal Protective Equipment