



THE REPUBLIC OF UGANDA
Ministry of Education and Sports

Directorate of Industrial Training



**Assessment and Training
Package**

For a

MUSHROOM FARMER

Qualification Level: 1

Occupational Cluster: Agriculture

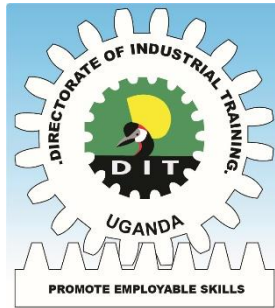
December 2020

Developed by:

**Directorate of Industrial Training
Qualification Standards Department**

Funded by:

Government of Uganda



Assessment and Training Package

For a

MUSHROOM FARMER

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Occupational Cluster: Agriculture

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Under BTVET Act, 2008, the functions of the Directorate of Industrial Training are:

- (a) To identify the needs of the labour market for occupational competencies that fall under the UVQF.
- (b) To regulate apprenticeship schemes.
- (c) To foster and promote entrepreneurial values and skills, as an integral part of the UVQF.
- (d) To secure adequate and sustainable financing for the efficient operations of the Directorate.
- (e) To accredit training institutions or companies as assessment centres.
- (f) To determine fees payable under the Act.
- (g) To develop, apply, expand and improve the purposeful application of Uganda vocational qualifications defined in the UVQF.
- (h) To assess and award Uganda Vocational Qualifications.
- (i) To promote on-the-job training in industry for apprenticeship, traineeship and indenture training and for other training such as further skills training and upgrading.
- (j) To prescribe the procedure for the making of training schemes.

Further to the above provisions, there is an established Uganda Vocational Qualifications Framework (UVQF), under part V of the BTVET Act, 2008. It is stated that:

The purpose of the UVQF is to;

- (a) Define occupational standards in the world of work.
- (b) Define assessment standards.
- (c) Award vocational qualifications of learners who meet the set standards of different studies.
- (d) Provide guidelines for modular training.

The UVQF shall follow principles of Competence Based Education and Training (CBET) which include:

- (a) Flexible training or learning modules.
- (b) Positive assessment and Certification.
- (c) Assessment of Prior Learning.
- (d) Recognition of formal and non-formal training.
- (e) Self-paced or individual learning.
- (f) Work place learning.

For award and recognition of certificates, the BTVET Act, 2008 provides that:

- (1) The Directorate and other examination boards established under the Act shall award certificates and diplomas for Business, Technical or Vocational Education and Training under the UVQF.
- (2) The Certificates and Diplomas to be awarded shall be in the form prescribed by the Minister on the recommendation of the Industrial Training Council.
- (3) The Certificates and Diplomas awarded under the Act shall be recognised in the Uganda education system and by the labour market.

Under the TVET Implementation Standards 2020, the proposed new mandate of the Directorate of Industrial Training shall be restricted to promoting the highest standards in the quality and efficiency of industrial training in the country and ensuring an adequate supply of properly trained manpower at all levels in the industry and the world of work.

The functions shall include:

- (a) Regulating Industrial Training and Trainers.
- (b) Developing Industrial Training Curricula.
- (c) Harmonising Curricula and Certificates of competence.
- (d) Assessing Industrial Training.
- (e) Development of Occupational Standards and Assessment and Training Packages (ATPs) for Trade Testing for the industry and world of work.
- (f) Awarding certificates in that respect.

At operational level in the Directorate, the Qualification Standards Department performs development tasks related to concepts, procedures and instruments for establishment of the UVQF in close collaboration with both public and private stakeholders in vocational training.

In particular, the Department organises and coordinates the development of Assessment and Training Packages for use in competence-based vocational training as well as standards-based assessment and certification.

The Directorate has therefore produced this Assessment and Training Package for use in implementing Competence-Based Education and Training mechanisms.

TABLE OF CONTENTS

Word from Permanent Secretary	iv
Executive Summary	vi
Abbreviations and acronyms.....	ix
Key definitions.....	x
1.0 ATP-PART I	1
Occupational Profile for a Mushroom Farmer	1
2.0 ATP-PART II.....	10
Training Modules for a Mushroom Farmer	10
3.0 ATP-PART III	25
Assessment Instruments for a Mushroom Farmer	25
Written Test Items (Samples)	27
Performance Test Items.....	39
4.0 ATP- PART IV	45
Information on Developing Process.....	45

Word from Permanent Secretary

The Kajubi Report (1989) and the Uganda Government White Paper on Education Review (1992) emphasised that the Uganda Secondary School Education should be vocationalised.

The World Bank Report on education in Uganda 2007 observed that although Uganda was experiencing steady economic growth on one hand, the secondary education curriculum was inadequately addressing the social and economic needs of the country on the other. The Report further noted that it is not the very top academic cadres that contribute most to the growth of the GDP but rather the competent middle level technicians that are flexible and technologically literate that the economy needs in the labour market at all levels.

Correspondingly, the NDP III 2020/21- 2024/5 highlights (i) low labour productivity (ii) high youth unemployment (38%) (iii) low transition rates from training to employment (35%) as some of the key challenges to Human Capital Development in Uganda.

In order to overcome these challenges, NDP III 2020/21- 2024/5, under objective 2 peaks the need to train the learners for the urgently needed skills and mainstream a dual education and training system. This paved way for the development of the lower secondary school vocational curriculum which supports both academic and vocational training.

The afore is in line with the Uganda Vision 2040. Under section 261, it emphasises that learners will be accorded opportunities to excel in the skills areas they are placed into. These will range from sports and cut to technical and vocational training. Hitherto, section 262 clearly states that the entire education system will be changed to emphasise practical skills, attitude and moral values.

Government of Uganda through the Ministry of Education and Sports rolled out the New Lower Secondary Curriculum in secondary schools countrywide during the first term of the academic year 2020. The overall goal of this curriculum is to produce graduates with employable skills and who are competitive in the labour market. It should be emphasised that vocational training will produce graduates who are employable. In the New curriculum, emphasis will be on equipping learners with employable skills and competencies. This will enable learners perform the requisite duties of the specified occupations. This is the reason why the lower secondary school vocational curriculum was tailored to the assessment requirements of the world of work.

Reading from the Curriculum Framework page 12, it is stated that the learners will be assessed by DIT. Upon assessment and certification, the graduates will be employable and competitive in the labour market. It's against this background that DIT, within its mandate vested in the BTVET Act, 2008 comes on board to take the lead in the development of the requisite Assessment and Training Packages (ATPs) for the various occupations that will be assessed under the Lower Secondary Curriculum.

The ATPs can be used by any training provider and/or those who wish to present themselves for Occupational Assessment and Certification.

Herewith, the Directorate of Industrial Training presents the Assessment and Training Package for training, assessment and certification of a **MUSHROOM FARMER QUALIFICATION LEVEL I.**

Finally, I thank all individuals, organisations and development partners who have contributed and/or participated in the development of this noble document.



Alex Kakooza
Permanent Secretary

Executive Summary

This Assessment and Training Package is a Competence-Based Education and Training (CBET) tool and consists of three major parts:

- 0.1 **PART I: The Occupational Profile (OP) of a MUSHROOM FARMER.** This Occupational Profile which was reviewed by Mushroom farmers practicing in the world of work mirrors the duties and tasks that Mushroom farmers are expected to perform.
- 0.2 **PART II: Training Modules** in the form of guidelines to train Mushroom farmers both on the job as well as in training centres (or combinations of both venues of learning). The Training Modules herein have been reviewed basing on the Occupational Profile and hence are directly relevant for employment.
- 0.3 **PART III: Assessment Instruments** in the form of performance (Practical) and written (theory) test items that can and should be used to assess whether a person complies with the requirements of employment as a MUSHROOM FARMER. These assessment instruments were reviewed jointly by job practitioners (Mushroom farmers) and instructors based on the occupational profile and training modules.
- 0.4 While the Occupational Profile (OP) contained in PART I of this document provides the information on **WHAT a person is expected to do** competently in the world of work, the test items, - including performance criteria- of PART III qualify the **HOW and/or HOW WELL a person must do the job.**
- 0.5 The modular format of the curriculum (PART II) allows learners to acquire job specific skills and knowledge (i.e. competencies) module by module. A single module can be accomplished within a relatively short duration allowing flexibility for learners to move directly into an entry level job, go for further modules or advance to higher levels of training. Modular courses allow more learners to access the training system because training centres as well as companies can accommodate more learners in a given period of time.
- 0.6 In addition to improved access, equity and relevance of BTVET, the UVQF will also enable people who are convinced to have acquired competencies laid down in this ATP through prior training and on-the-job experience to access assessment and certification directly; be it on the basis of a single module, a group of modules or all modules pertaining to the occupation at once. This achievement will facilitate Recognition of Prior Learning (RPL).

0.7 The parts of this Assessment and Training Package were sequentially reviewed as follows:

- i Part 1: Occupational Profile: **August 2020**
- ii Part 2: Training Modules: **August 2020**
- iii Part 3: Assessment Instruments (initial bank): **August 2020**

This ATP (or parts of it) may be periodically revised to match the dynamic trends in the occupation and hence issued in different versions.

DIT takes responsibility of any shortcomings that might be identified in this publication and welcomes suggestions for effectively addressing the inadequacies. The suggestion can be communicated to DIT through P.O. Box 20050, Kampala or through email uvaf.dit@gmail.com.



Patrick Byakatonda
Ag Director

Acknowledgement

The Qualifications Standards Department of DIT acknowledges the valuable contributions to the review of this Assessment and Training Package by the following persons, Institutions and organisations:

- Members of the DIT Industrial Training Council.
- The Director and staff of DIT.
- Ministry of Education and Sports.
- The practitioners from the world of work.
- Teachers and instructors of mushroom farming from various secondary schools.
- Agriculture Curriculum Specialists from NCDC.
- Examination specialists from UNEB.
- The facilitators involved in guiding the development panels in their activities.
- The Government of Uganda for financing the development of this ATP.

Abbreviations and acronyms

A&C	Assessment and Certification
ATP	Assessment and Training Packages
CBET	Competency Based Education and Training
DIT	Directorate of Industrial Training
FAO	Food and Agriculture Organisation
ITC	Industrial Training Council
GoU	Government of Uganda
HACCP	Hazard Analysis Critical Control Point
LWA	Learning-working Assignment
MAAF	Ministry of Agriculture, Animal Industry and Fisheries
MC	Modular Curriculum
MoH	Ministry of Health
MoES	Ministry of Education and Sports
NEMA	National Environment Management Authority
OP	Occupational Profile
PEX	Practical Exercise
OWC	Operation Wealth Creation
PTI	Performance (Practical) Test Item
QS	Qualification Standards
RPL	Recognition of Prior Learning
TIB	Test Item Bank
TVET	Technical, Vocational, Education and Training
UNEB	Uganda National Examination Board
UIRI	Uganda Industrial Research Institute
UNBS	Uganda National Bureau of Standards
URA	Uganda Revenue Authority
UVQ	Uganda Vocational Qualification
UVQF	Uganda Vocational Qualifications Framework
WTI	Written (Theory) Test Item

Key definitions

Assessment	Assessment is the means by which evidence is gathered and judged to decide if an individual has met the stipulated assessment standards or not. Testing is a form of formal assessment.
Certification	Certification is a formal procedure to issue a certificate (qualification) to an individual that has demonstrated during formal assessment that he/she is competent to perform the tasks specified in the occupational profile.
Competence	Integration of skills, knowledge, attitudes, attributes and expertise in performing tasks in the world of work to a set standard.
Competency	(Occupational) competency is understood as the ability to perform tasks common to an occupation to a set standard.
CBET	Competence-Based Education and Training means that programmes: <ol style="list-style-type: none">1. have content directly related to work2. focus is on 'doing something well'3. assessment is based upon industry work standards, and4. curricula are developed in modular form
Duty	A Duty describes a large area of work in performance terms. A duty serves as a title for a cluster of related Tasks (see also: TASK).
Learning-Working Assignment (LWA)	LWA are simulated or real job situations / assignments that are suitable for learning in a training environment (e.g. "small projects"). In a working environment LWAs are real work situations /assignments.
Modules	Modules are part(s) of a curriculum. Modules can be considered as "self-contained" partial qualifications which are described by learning outcomes or competencies and which can be assessed and certified individually.

Occupational Profile (OP) An Occupational Profile is an overview of the duties and tasks a job incumbent is expected to perform competently in employment.

Occupational Profiles developed by practitioners from the world of work enhance the relevance of training and learning to the requirements of the world of work.

Occupational Profiles define what a person is supposed to do in performance terms. It also contains generic information regarding related knowledge and skills, attitudes/behavior, tools, materials and equipment required to perform as well as trends/ concerns in the occupation.

Occupational profiles are the reference points for developing modular curricular and assessment standards.

Qualification A qualification is a formal recognition for demonstrating competence, based on formal assessment against set standards. A qualification is provided to the individual in form of a certificate specifying the nature of the competence.

Task Job tasks represent the smallest unit of job activities with a meaningful outcome. Tasks result in a product, service, or decision. They represent an assignable unit of work and have a definite beginning and ending point. Tasks can be observed and measured. (Also see: Duty)

1.0 ATP-PART I

Occupational Profile for a MUSHROOM FARMER

- 1.1 The OCCUPATIONAL PROFILE (OP) for “MUSHROOM FARMER” below defines the **Duties** and **Tasks** a competent MUSHROOM FARMER is expected to perform in the world of work (on the job) in Uganda and the East African region today.
- 1.2 Since it reflects the skill requirements of work life, the Occupational Profile is the reference document for the subsequent development of training modules and assessment instruments (test items) which are directly relevant to employment in Ugandan and the East African businesses and industries.
- 1.3 To ensure that the Occupational Profile is relevant for employment in Uganda and East Africa, the DIT used the method of “occupational/job profiling.

This approach involves the brainstorming of a panel of 8 to 12 competent job practitioners guided by trained and experienced facilitators. During a two-day workshop the panelists define the duties and tasks performed in employment, as well as the prerequisite skills, knowledge, attitudes, tools and equipment, and the future trends and concerns in the occupation/job.

- 1.4 The panelists, facilitators and coordinators who participated in developing this Occupational Profile for MUSHROOM FARMER are listed on the following page.

Job Expert Panel

Akankwasa Pius

Local Farmer

Mayambala Jennifer

Uganda Industrial Research Institute

Kamuntu Edgar

Global Agro Ent Ltd

Nkugwa Edward

Lubiri Secondary School

Sedikadiwa James. K

NCDC

Abenakyo Faith

St. Mary's College Kisubi

Tukwasibwe William

Global Agro Ent Ltd

Naturinda Movadi

Masaka Secondary School

Kyokwijuka Immaculate

Lommtu Unique Supplies Ltd

Okonye Xavier

Kibibi Secondary School

Atugumya Pheonah

Paac Mushroom Growers

Lule Esther

Fraster Mushrooms

Kiidu Abel

African Mushroom Growers (U) Ltd

Musasane Ambrose

Local Farmer

Atuhire Eunice

Local Farmer

Facilitators

Komugisha Noeline

Directorate of Industrial Training

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Directorate of Industrial Training

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Directorate of Industrial Training

Co-ordinator

Elizabeth Ruth Mukyala

Directorate of Industrial Training

Funded by

Government of Uganda



THE REPUBLIC OF UGANDA
Ministry of Education and Sports

Directorate of Industrial Training

Occupational Profile
For a
"Mushroom Farmer"

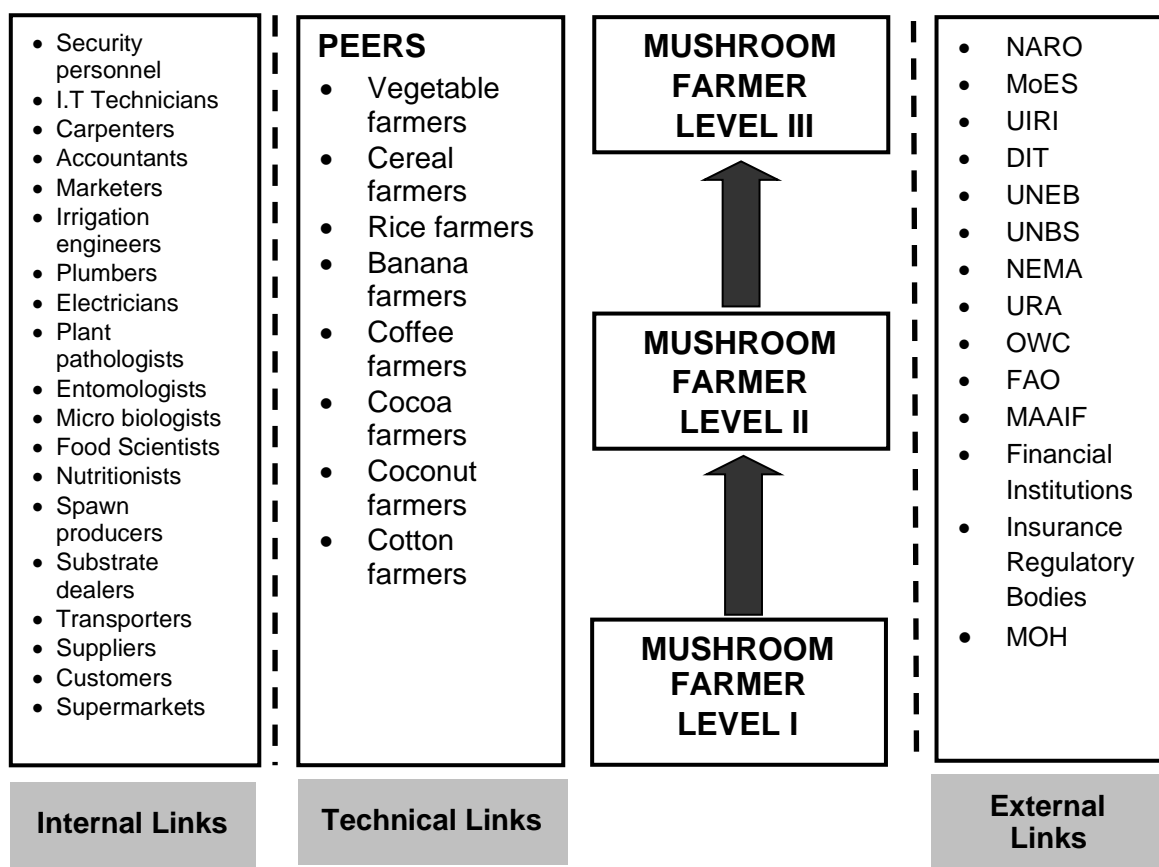
Developed by: Directorate of Industrial Training
(Qualifications Standards)

Dates of workshop: 24th August – 4th September
2020

NOMENCLATURE FOR THE OCCUPATION OF MUSHROOM FARMER

Definition: A **MUSHROOM FARMER** is a person who produces mushrooms for domestic and commercial purposes.

JOB ORGANISATIONAL CHART FOR A MUSHROOM FARMER



Descriptions for the levels in the occupation of MUSHROOM Farmer

UVQF Level I Mushroom Farmer: Grows oyster mushrooms from readily available substrates for both domestic and commercial purposes.

UVQF Level II Mushroom Farmer: Formulates substrates for oyster mushrooms and is able to acquire gardens and produce other types of mushrooms.

UVQF Level III Mushroom Farmer: Produces spawn, design mushroom facilities for different types of mushrooms, formulates substrates and adds value for different types of mushrooms.

Duties and Tasks

A. PLAN MUSHROOM FARMING ENTERPRISE	A1 Carryout feasibility study	A2 Prepare business plan	A3 Determine mushroom farm location
	A4 Determine factor inputs	A5 Determine Mushroom Species	A6 Determine farm layout
	A7 Determine mushroom structure	A8 Prepare work schedule	

B. ESTABLISH MUSHROOM FARM	B1 Select Site	B2 Procure tools, equipment and materials	B3 Clear site
	B4 Set up mushroom farm infrastructures.	B5 Set up Mushroom Structure	B6 Install utilities
	B7 Fix accessories		

C. PREPARE SPAWN	C1 Sterilise ingredients and workplace	C2 Prepare media	C3 Pack media
	C4 Extract tissue	C5 Inoculate media	C6 Prepare mother culture
	C7 Prepare mother spawn	C8 Prepare commercial spawn	

D. ESTABLISH MUSHROOM GARDEN	D1 Determine substrates	D2 Sort substrate	D3 Soak substrate
	D4 Ferment substrates	D5 Sterilise substrate	D6 Inoculate substrate
	D7 Incubate garden		

E. MANAGE FRUITING GARDEN	E1 Transfer gardens	E2 Slit gardens	E3 Control humidity
	E4 Control temperature	E5 Control aération	E6 Control light
	E7 Control pests and diseases	E8 Maintain accessories	

F. HARVEST MUSHROOMS	F1 Prepare harvesting material and tools	F2 Identify mature mushrooms	F3 Pluck oyster mushrooms
	F4 Pick button mushrooms	F5 Uproot ganoderma mushrooms	F6 Clean Mushrooms

G. PERFORM POST-HARVEST HANDLING	G1 Sort mushrooms	G2 Grade mushrooms	G3 Weigh mushrooms
	G4 Preserve mushrooms	G5 Bulk mushrooms	G6 Store mushrooms

H. MARKET MUSHROOMS	H1 Brand mushrooms	H2 Label mushrooms	H3 Pack mushrooms
	H4 Price mushrooms	H5 Carryout Sales promotion	H6 Transport mushrooms
	H7 Sell mushrooms		

I. PERFORM ADMINISTRATIVE TASKS	I1 Keep Business records	I2 Supervise workers	I3 Appraise workers
	I4 Recruit workers	I5 Conduct meetings	I6 Manage finances
	I7 Pay bills	I8 Formalise business	I9 Network with stake holders
	I10 Provide security	I11 Manage tools and equipment	I12 Train workers
	I13 Pursue continuous professional development		

J. PERFORM OCCUPATIONAL SAFETY, HEALTH AND ENVIRONMENTAL PRACTICES	J1 Maintain personal hygiene and sanitation	J2 Use personnel protective equipment	J3 Practice bio-safety measures
	J4 Sensitise workers on health issues	J5 Manage waste	J6 Perform firefighting
	J7 Display safety signs	J8 Train workers on safety	J9 Observe HACCP
	J10 Administer first aid		

Additional Information

Generic Knowledge & Skills

1. Resource mobilisation
2. Public relations
3. Environmental changes
4. Safety, health and environment
5. Tools, equipment and implement usage, operation and maintenance
6. Types of mushrooms
7. Life cycle of mushrooms
8. Preparation of substrate
9. Problem solving
10. Numeracy and literacy skills
11. Counselling and guidance
12. Time management
13. Inter-personal relations
14. Analytical skills
15. Business and customer service skills
16. Human resource management
17. Pest and disease management
18. Cleaning skills
19. Substrate types
20. Planning skills
21. Leadership skills
22. Design and construction of structures
23. Ergonomics
24. Staff training and mentoring
25. Conditions for mushroom growing
26. Marketing functions
27. Processing mushrooms
28. Uses of mushrooms
29. Inoculating substrates
30. Incubating mushrooms gardens
31. Bagging spawn substrates
32. Slitting bagged substrates
33. Disinfecting mushroom house
34. Substrate supplements
35. Bio-security practices
36. Occupational health, safety and environmental practices
37. Hazard Analysis Critical Control Points(HACCP)
38. Mushroom fruiting management
39. Knowledge on pH
40. Knowledge on domestic and foreign markets
41. Taxation
42. Market research

Tools, Materials and Equipment

- | | | |
|---------------------------|-------------------------|--------------------------------------|
| 1. Drum | 42. Rice/maize bran | 84. Spatula |
| 2. Drum stand | 43. Maize straws | 85. Irish potatoes |
| 3. Knife | 44. Thermometers | 86. Sweet potatoes |
| 4. Ropes/strings | 45. Bottles | 87. Millet grain |
| 5. Poles | 46. Hygrometer | 88. Oven |
| 6. Charcoal/ash | 47. Humidifier | 89. Sterilisers |
| 7. Tape measure | 48. Biogas | 90. Autoclave |
| 8. Timber | 49. Gas | 91. Brooms |
| 9. Papyrus | 50. Hose pipes | 92. Sand |
| 10. Nails | 51. Pump | 93. Wheat grain |
| 11. Sprayer | 52. Watch/clock | 94. Maize cobs |
| 12. Watering can | 53. Ribbons | 95. Saw dust |
| 13. Hammer | 54. Fan | 96. Ply wood |
| 14. Saw blade | 55. Air conditioner | 97. Conical flask |
| 15. Tarpaulin | 56. Insect trappers | 98. Pipette |
| 16. Spade | 57. Incinerators | 99. Beaker |
| 17. Weighing scale | 58. Security cameras | 100. Overcoats |
| 18. Petri dishes | 59. Sanitiser | 101. Rake |
| 19. Test tubes | 60. Disinfectant | 102. Jerry cans |
| 20. Razorblades | 61. PH meter scale | 103. Chain link |
| 21. Water tank trays | 62. Universal indicator | 104. Wire mesh |
| 22. Containers/basins | 63. Overalls | 105. Rat trap |
| 23. Sacks | 64. Salt | 106. Wood shavings |
| 24. Polythene bags/tubers | 65. Sugar | 107. Grinder |
| 25. Stationery | 66. Solar drier | 108. Flavour and preservatives |
| 26. Bottle necks | 67. Motorbike | 109. Fire extinguishers |
| 27. Pins/needles | 68. Bicycle | 110. Telephones |
| 28. Rubber bands | 69. Wheelbarrow | 111. Misters |
| 29. Cotton wool | 70. Vehicle | 112. Pipes |
| 30. Spirit | 71. Fridge | 113. Microscope |
| 31. Bio-safe | 72. Invoices | 114. Candles |
| 32. Spawn | 73. Records books | 115. Aluminum foil |
| 33. Gloves | 74. hoe | 116. Glucose |
| 34. Masks | 75. DCP paper | 117. Water dispenser |
| 35. Water | 76. Foam plates | 118. Iron bars |
| 36. Gumboots | 77. Plastic plates | 119. Construction/building materials |
| 37. Computers | 78. Cling film | 120. Knapsack sprayer |
| 38. Iron sheets | 79. Training manuals | |
| 39. Firewood | 80. Labels | |
| 40. husks | 81. Stamps | |
| 41. Lime | 82. Furniture | |
| | 83. Agar | |

Attitudes/ Traits/ Behaviour

1. Honesty
2. Transparency
3. Creativity
4. Commitment
5. Good listener
6. Flexibility
7. Result oriented
8. Curious
9. Innovativeness
10. Responsible
11. Healthy
12. Knowledgeable
13. Patience
14. Polite
15. Vigilant
16. Trainable
17. Respectful
18. Co-operative
19. Emphatic
20. Organised
21. Sociable
22. Tolerant
23. Hardworking
24. Observant
25. Team work
26. Discipline
27. Good time management
28. Self-management
29. Economical
30. Diligence
31. Good decision making
32. Trust worthy

Trends and Concerns

1. New varieties of mushrooms
2. Need to benchmark other mushroom farmers
3. Expansion of mushroom business
4. Exportation of mushrooms
5. Price fluctuation
6. Limited preserving and processing facilities
7. Forming mushroom farmer groups
8. Technology advancement
9. Need for mechanisation
10. Unfavourable financial credit
11. Poor structures
12. Value addition to mushrooms
13. Need for research in different substrates
14. Climate changes
15. Limited management skills
16. Customer care
17. Inadequate centres for spawn supply
18. Inadequate networking between farmers
19. Inadequate capital
20. Inadequate land
21. Computer literacy
22. Need for technology transfer
23. Need for quality spawn
24. Lack of mushroom cooperatives
25. Limited government support and involvement
26. Limited exposure
27. Limited publicity
28. Seasonal availability of substrates
29. Quality satisfaction
30. Emerging markets
31. Threats from genetically modified organisms
32. Feeding habits

2.0 ATP-PART II

Training Modules for a MUSHROOM FARMER

- 2.1 A curriculum is a “guide / plan for teaching and learning” which provides a guide to teachers, instructors and learners. In the envisaged system of competence-based or outcome-oriented education and training (CBET), Curricula are no longer the benchmark against which assessment is conducted. It is rather the Occupational Profile and the related Test Items that provide the benchmark for assessment as well as for Curriculum development.
- 2.2 This modular format of the curriculum allows learners of the MUSHROOM FARMER OCCUPATION to acquire job specific skills and knowledge (i.e. competencies) module by module. A single module can be accomplished within a relatively short duration of time allowing learners to move directly into an entry level job, do further modules and advance to higher levels of training. Modular courses allow more learners to access the training system because training centers as well as companies can accommodate more students in a given period of time.
- 2.3 The modules were developed jointly by both instructors from training centers and job practitioners. They were developed using the Occupational Profile as a reference point and taking into account the specifications of training and learning outcomes in the form of Test Items described in Part II.
- 2.4 The modules contain “Learning-Working Assignments” (LWAs) and related “Practical Exercises” (PEXs) as key elements.
- LWAs are simulated or real job situations / assignments that are suitable for learning in a training environment (e.g. “small projects”). In a working environment, LWAs are real work situations.
- PEXs are therefore sub-sets of a LWA.
- 2.5 In principle, and following the philosophy of Competence-Based Education and Training (CBET), the modules can be used as a guide for learning in a training center or at the work place; or combinations of both.

WHO IS A MUSHROOM FARMER LEVEL 1?

Mushroom Farmer Level I: Grows oyster mushrooms from readily available substrates for both domestic and commercial purposes.

TRAINING MODULES FOR MUSHROOM FARMER UVQ LEVEL 1

Code	Module Title	Average duration	
		Contact hours	Weeks
UE/MF/M1.1	Establish a Mushroom Farm Enterprise	240	06
UE/MF/M1.2	Establish a Mushroom Garden	160	04
UE/MF/M1.3	Manage a Mushroom Garden	160	04
UE/MF/M1.4	Perform Harvesting and Post-Harvest Handling of Mushrooms	160	04
Summary	4 Training modules	720hrs	18 Weeks

Note: Average duration is contact time but NOT calendar duration

It is assumed that:

- 1 day is equivalent to 8 hours of nominal learning and
- 1 month is equivalent to 160 hours of nominal learning.

Information given on the average duration of training should be understood as a guideline. Quick learners may need less time than indicated or vice versa.

At completion of a module, the learner should be able to satisfactorily perform the included Learning Working Assignments, their Practical Exercises and attached theoretical instruction, as the minimum exposure.

Prior to summative assessment by recognised Agencies, the users of these Module Guides are encouraged to carefully consider continuous assessment using samples of (or similar) performance (practical) and written test items available in Part 3 of this ATP.

Code	UE/MF/M1.1
Module title	M1.1: Establish a Mushroom Farm Enterprise
Related Qualification	Part of: Uganda Vocational Qualification (MUSHROOM FARMER UVQ1)
Qualification Level	1
Module purpose	By the end of this module the trainee shall be able to mobilise resources and establish a mushroom farm enterprise.
Learning-Working Assignments (LWAs)	<p>LWA 1/1: Plan Mushroom Farming Enterprise LWA 1/2: Mobilise Resources LWA 1/3: Construct Mushroom House LWA 1/4: Maintain Mushroom Facility LWA 1/5: Perform Sales Promotion LWA 1/6: Perform Occupational Health and Environmental Protection Practices</p> <p>Note:</p> <ol style="list-style-type: none"> 1. The learning exercises must be repeated until the trainee acquires a targeted competence. 2. The trainer is advised to deliver relevant theoretical instruction with demonstrations as required to perform each learning working assignment.
Related Practical Exercises (PEXs)	<p>LWA 1/1: Plan Mushroom Farming Enterprise PEX 1.1: Carryout feasibility study PEX 1.2: Carryout market survey PEX 1.3: Determine required resources PEX 1.4: Prepare financial plan PEX 1.5: Prepare procurement plan PEX 1.6: Determine enterprise location PEX 1.7: Schedule production activities PEX 1.8: Insure the mushroom enterprise PEX 1.9: Formalise mushroom enterprise</p> <p>LWA 1/2: Mobilise Resources PEX 2.1: Secure finances PEX 2.2: Secure land PEX 2.3: Secure human resources PEX 2.4: Secure tools, equipment and materials</p> <p>LWA 1/3: Construct Mushroom House PEX 3.1: Select site</p>

	<p>PEX 3.2: Determine farm layout PEX 3.3: Determine structure design PEX 3.4: Secure construction materials PEX 3.5: Erect structures PEX 3.6: Install utilities PEX 3.7: Fix accessories PEX 3.8: Fence area</p> <p>LWA 1/4: Maintain Mushroom Facility PEX 4.1: Clean mushroom structures PEX 4.2: Mend leaking structures' roofs PEX 4.3: Repair broken accessories PEX 4.4: Re-paint structure</p> <p>LWA 1/5: Perform Sales Promotion PEX 5.1: Brand mushrooms PEX 5.2: Pack mushrooms PEX 5.3: Label mushrooms PEX 5.4: Price mushrooms PEX 5.5: Advertise mushrooms PEX 5.6: Distribute mushrooms PEX 5.7: Transport mushrooms PEX 5.8: Sell mushrooms PEX 5.9: Generate sales records PEX 5.10: Communicate with customers</p> <p>LWA 1/6: Perform Occupational Health and Environmental Protection Practices PEX 6.1: Maintain personal hygiene and sanitation PEX 6.2: Display safety signs PEX 6.3: Observe hazard analysis critical control points (HACCP) PEX 6.4: Sensitise workers on health and safety PEX 6.5: Use personnel protective equipment PEX 6.6: Practice bio-safety measures PEX 6.7: Perform firefighting PEX 6.8: Administer first aid PEX 6.9: Manage waste</p>
<p>Occupational health and safety</p>	<p>Precautions, rules and regulations on occupational health, safety and environmental protection included in the listed related knowledge should be observed and demonstrated during LWAs and PEXs.</p>

Pre-requisite modules	None
Related knowledge/ theory	<p><i>For occupational theory suggested for instruction/ demonstration, the trainer is not limited to the outline below. In any case, related knowledge/ theory may be obtained from various recognised reference materials as appropriate:</i></p> <ul style="list-style-type: none"> • Feasibility study & market survey • Budgeting • Drainage, soil types and topography • Wind direction • Sun direction • Structural design • Sanitation criteria • Bio safety measures • Firefighting techniques • Resource mobilisation • Procurement procedures • Different types of construction materials • Water availability • Fixing mushroom house accessories • Installing mushroom house utilities • Tools and equipment & tools storage and maintenance • Measurements and numeracy • Communication skills • Advertising techniques • Transporting • Branding techniques • Pricing and negotiation • Labeling • Record keeping • Weighing techniques • Communication & ICT • Mentoring • Business and customer care • Exhibition • Marketing and sales promotion • Research methods • Time management • Team work and cooperation • Regulations and policies • Quality control • Waste disposal and management • Biosafety measures
Average duration of learning	<p>240hrs (30 days) of normal learning suggested.</p> <ul style="list-style-type: none"> • <i>05 days of occupational theory.</i> • <i>25 days of occupational practice.</i>

Suggestions on organisation of learning	The acquisition of competencies (skills, knowledge, attitudes) described in this module may take place at a training center or its equivalent provided all equipment and materials required for training are in place.
Assessment	Assessment to be conducted according to established regulations by a recognised assessment body using related practical and written test items from Item bank.
Minimum required tools/ equipment/ implements or equivalent	computers, calculators, furniture, tape measure, watering can, hoes, slashers, saws, barbed wire, grader, wheelbarrows, spades, jerrycans, hammers, first aid kit, fire extinguishers, telephones, vehicles, motorcycles, wheel barrow, stapling machine, punching machine.
Minimum required materials and consumables or equivalent	pens, pencils, ropes, nails, cement, water, gloves, gumboots, record books, sand, paint, timber, posters, burners, sole tape, glue, pins, stumps and pads, receipt books, invoice, cheque books, record books, visitors' books, files, airtime, fuel, packs,
Special notes	The theory must be integrated into the practice during training.

Code	UE/MF/M1.2
Module title	M1.2: Establish a Mushroom Garden
Related Qualification	Part of: Uganda Vocational Qualification (MUSHROOM FARMER UVQ1)
Qualification Level	1
Module purpose	At the end of this module, the trainee shall be able to produce a fully inoculated, perforated and tightened mushroom garden.
Learning-Working Assignments (LWAs)	<p>LWA 2/1: Prepare Substrate</p> <p>LWA 2/2: Inoculate Substrate</p> <p>LWA 2/3: Generate Records</p> <p>LWA 2/4: Perform Occupational Health, Safety and Environmental Protection Practices</p> <p>Note:</p> <ol style="list-style-type: none"> 1. <i>The learning exercises must be repeated until the trainee acquires a targeted competence.</i> 2. <i>The trainer is advised to deliver relevant theoretical instruction with demonstrations as required to perform each learning working assignment.</i>
Related Practical Exercises (PEXs)	<p>LWA 2/1: Prepare Substrate</p> <p>PEX 1.1: Determine substrate</p> <p>PEX 1.2: Sort substrate</p> <p>PEX 1.3: Soak substrate</p> <p>PEX 1.4: Drain substrate</p> <p>PEX 1.5: Ferment substrate</p> <p>PEX 1.6: Supplement substrate</p> <p>PEX 1.7: Control pH</p> <p>PEX 1.8: Bag substrate</p> <p>PEX 1.9: Sterilise substrate</p> <hr/> <p>LWA 2/2: Inoculate Substrate</p> <p>PEX 2.1: Clean inoculation facility</p> <p>PEX 2.2: Disinfect inoculation facility</p> <p>PEX 2.3: Sterilise tools and equipment</p> <p>PEX 2.4: Transfer substrate to inoculation facility</p> <p>PEX 2.5: Cool substrate</p> <p>PEX 2.6: Spawn substrate</p> <p>PEX 2.7: Perforate gardens</p>

	<p>LWA 2/3: Generate Records PEX 3.1: Prepare inoculation records PEX 3.2: Keep procurement records PEX 3.3: Keep human resource records PEX 3.4: Prepare tools and equipment Inventory</p> <p>LWA 2/4: Perform Occupational Health and Environmental Protection Practices PEX 4.1: Maintain personal hygiene and sanitation PEX 4.2: Display safety signs PEX 4.3: Observe hazard analysis critical control points (HACCP) PEX 4.4: Sensitise workers on health and safety PEX 4.5: Use personnel protective equipment PEX 4.6: Practice bio-safety measures PEX 4.7: Perform fire fighting PEX 4.8: Administer first aid PEX 4.9: Manage waste</p>
<p>Occupational health and safety</p>	<p>Precautions, rules and regulations on occupational health, safety and environmental protection included in the listed related knowledge should be observed and demonstrated during LWAs and PEXs.</p>
<p>Pre-requisite modules</p>	<p>None</p>
<p>Related knowledge/ theory</p>	<p><i>For occupational theory suggested for instruction/ demonstration, the trainer is not limited to the outline below. In any case, related knowledge/ theory may be obtained from various recognised reference materials as appropriate:</i></p> <ul style="list-style-type: none"> • Types of substrates & sources of substrate • Soaking substrates & sorting substrates • Sterilisation methods • Drainage techniques • Substrate fermentation techniques • Supplementation techniques and types of supplements • pH management • Quality spawn • Inoculation techniques • Packaging materials • Sources of spawn • Characteristics of quality substrates • Usage of tools and equipment • Sanitation criteria

Average duration of learning	160 hours (20 days) of nominal learning suggested to include <ul style="list-style-type: none"> • 5 days of occupational theory and • 15 days of occupational practice
Suggestions on organisation of learning	The acquisition of competencies (skills, knowledge, attitudes) described in this module may take place at a training center or its equivalent provided all equipment and materials required for training are in place.
Assessment	Assessment to be conducted according to established regulations by recognised assessment body using related practical and written test items from Item bank
Minimum required tools/ equipment/ implements or equivalent	drums, spade, tarpaulin, rack, rakes, sacks, rings, weighing scale, jerrycans, spoons, basin, gum boots, rubber straps.
Minimum required materials and consumables or equivalent	lime, supplements (e.g. Bran), polythene bags spawn, substrates, papers, water, disinfectant strings tooth picks. gloves, razor blades, labels, heat source, staple wires, face masks, stationery
Special notes	The theory must be integrated into the practice during training

Code	UE/MF/M1.3
Module title	M1.3: Manage Mushroom Garden
Related Qualification	Part of: Uganda Vocational Qualification (MUSHROOM FARMER UVQ1)
Qualification Level	1
Module purpose	At the end of this module, a trainee shall be able to manage oyster mushroom gardens to fruiting.
Learning-Working Assignments (LWAs)	<p>LWA 3/1: Manage Colonisation</p> <p>LWA 3/2: Manage Fruiting</p> <p>LWA 3/3: Perform Occupational Health, Safety and Environmental Protection Practices</p> <p>Note:</p> <ol style="list-style-type: none"> 1. <i>The learning exercises must be repeated until the trainee acquires a targeted competence.</i> 2. <i>The trainer is advised to deliver relevant theoretical instruction with demonstrations as required to perform each learning working assignment.</i>
Related Practical Exercises (PEXs)	<p>LWA 3/1: Manage Colonisation</p> <p>PEX 1.1: Clean Inoculation room</p> <p>PEX 1.2: Disinfect inoculation room</p> <p>PEX 1.3: Transfer gardens to inoculation room</p> <p>PEX 1.4: Monitor temperature</p> <p>PEX 1.5: Monitor aeration</p> <p>PEX 1.6: Monitor lighting</p> <p>PEX 1.7: Control pests and diseases</p> <p>PEX 1.8: Keep inoculation records</p>
	<p>LWA 3/2: Manage Fruiting</p> <p>PEX 2.1: Transfer colonised gardens to fruiting room</p> <p>PEX 2.2: Slit gardens</p> <p>PEX 2.3: Monitor humidity</p> <p>PEX 2.4: Monitor light</p> <p>PEX 2.5: Monitor aeration</p> <p>PEX 2.6: Clean mushroom fruiting facility</p> <p>PEX 2.7: Monitor temperature</p> <p>PEX 2.8: Control pests and diseases</p>

	<p>LWA 3/3: Perform Occupational Health and Environmental Protection Practices</p> <p>PEX 3.1: Maintain personal hygiene and sanitation PEX 3.2: Display safety signs PEX 3.3: Observe HACCP PEX 3.4: Sensitise workers on health and safety PEX 3.5: Use personnel protective equipment PEX 3.6: Practice bio-safety measures PEX 3.7: Perform fire fighting PEX 3.8: Administer first aid PEX 3.9: Manage waste</p>
<p>Occupational health and safety</p>	<p>Precautions, rules and regulations on occupational health, safety and environmental protection included in the listed related knowledge should be observed and demonstrated during LWAs and PEXs.</p>
<p>Pre-requisite modules</p>	<p>None</p>
<p>Related knowledge/ theory</p>	<p><i>For occupational theory suggested for instruction/ demonstration, the trainer is not limited to the outline below. In any case, related knowledge/ theory may be obtained from various recognised reference materials as appropriate:</i></p> <ul style="list-style-type: none"> • Mushroom Garden Inoculation • Mushroom garden fruiting • Cleaning mushroom facility • Mushroom infections • Mushroom garden infections control methods • Tools and equipment usage • Mushroom pests and diseases • Mushroom pests and disease control methods • Mushroom facility disinfectants • Slitting mushroom gardens • Humidity control • Light control • Record keeping • Temperature control • Occupational health safety and environmental protection practices • HACCP • Waste management

Average duration of learning	160hrs (20 days) of nominal learning suggested to include: <ul style="list-style-type: none"> • 5 days of occupational theory and • 15 days of occupational practice
Suggestions on organisation of learning	The acquisition of competencies (skills, knowledge, attitudes) described in this module may take place at a training center or its equivalent provided all equipment and materials required for training are in place.
Assessment	Assessment to be conducted according to established regulations by a recognised assessment body using related practical and written test items from Item bank
Minimum required tools/ equipment/ implements or equivalent	broom, brush, bucket, sprayer, room thermometer, insect traps, rodent traps, computers, humidifier, hygrometer, gum boots, face mask, jerry can, watering can.
Minimum required materials and consumables or equivalent	water, liquid soap, disinfectants, salt, spirit papers, books pens, papyrus mats, sand, polythene sheets, charcoal dust, linen, gravel, plywood, gloves.
Special notes	The theory must be integrated into the practice during training

Code	UE/MF/M1.4
Module title	M1.4: Perform Harvesting and Post-Harvest Handling of Mushrooms
Related Qualification	Part of: Uganda Vocational Qualification (MUSHROOM FARMER UVQ1)
Qualification Level	1
Module purpose	By the end of this module, the trainee shall be able to harvest mushrooms and carryout post-harvest handling of mushroom according to the recommended standards.
Learning-Working Assignments (LWAs)	<p>LWA 4/1: Prepare Harvesting Tools and Equipment</p> <p>LWA 4/2: Harvest Mushrooms</p> <p>LWA 4/3: Perform Post-harvest Handling of Mushrooms</p> <p>LWA 4/4: Perform Occupational Health, Safety and Environmental Protection Practices</p> <p>Note:</p> <ol style="list-style-type: none"> 1. <i>The learning exercises must be repeated until the trainee acquires a targeted competence.</i> 2. <i>The trainer is advised to deliver relevant theoretical instruction with demonstrations as required to perform each Learning Working Assignment.</i>
Related Practical Exercises (PEXs)	<p>LWA 4/1: Prepare Harvesting Tools and Equipment</p> <p>PEX 1.1: Select tools and equipment</p> <p>PEX 1.2: Assemble tools and equipment</p> <p>PEX 1.3: Disinfect tools and equipment</p>
	<p>LWA 4/2: Harvest Mushrooms</p> <p>PEX 2.1: Identify mature mushrooms</p> <p>PEX 2.2: Pluck oyster mushrooms</p> <p>PEX 2.3: Clean mushrooms</p> <p>PEX 2.4: Sort mushrooms</p> <p>PEX 2.5: Weigh mushrooms</p> <p>PEX 2.6: Bulk mushrooms</p> <p>PEX 2.7: Generate harvest records</p>
	<p>LWA 4/3: Perform Post-harvest Handling of Mushrooms</p> <p>PEX 3.1: Assemble tools and equipment</p> <p>PEX 3.2: Preserve mushrooms</p> <p>PEX 3.3: Pack mushrooms</p> <p>PEX 3.4: Weigh mushrooms</p>

	<p>PEX 3.5: Clean and disinfect store PEX 3.6: Record preserved mushrooms PEX 3.7: Store mushrooms PEX 3.8: Clean and disinfect tools and equipment PEX 3.9: Store tools and equipment</p> <hr/> <p>LWA 4/4: Perform Occupational Health and Environmental Protection Practices</p> <p>PEX 4.1: Maintain personal hygiene and sanitation PEX 4.2: Sensitise workers on health and safety PEX 4.3: Use personnel protective equipment PEX 4.4: Store tools and equipment PEX 4.5: Practice bio-safety measures PEX 4.6: Perform fire fighting PEX 4.7: Administer first aid PEX 4.8: Manage waste PEX 4.9: Comply with safety policies and regulation</p>
Occupational health and safety	<p>Precautions, rules and regulations on occupational health, safety and environmental protection included in the listed related knowledge should be observed and demonstrated during LWAs and PEXs.</p>
Pre-requisite modules	<p>None</p>
Related knowledge/ theory	<p><i>For occupational theory suggested for instruction/ demonstration, the trainer is not limited to the outline below. In any case, related knowledge/ theory may be obtained from various recognised reference materials as appropriate:</i></p> <ul style="list-style-type: none"> • ICT application • Weighing techniques • Packing methods • Preservation methods • Types of disinfectants • Storage methods • Harvesting techniques • Transport techniques • Sorting methods • Grading methods • Tools and equipment usage • Maturity indicators of mushrooms • Record keeping • Shelf life of mushrooms

	<ul style="list-style-type: none"> • Sterilisation methods • Waste management • Disinfection techniques • HACCP • OHSE
Average duration of learning	160 hours (20 days) of normal learning suggested. <ul style="list-style-type: none"> • 05 days of occupational theory. • 15 days of occupational practices.
Suggestions on organisation of learning	The acquisition of competencies (skills, knowledge, attitudes) described in this module may take place at a training center or its equivalent provided all equipment and materials required for training are in place.
Assessment	Assessment to be conducted according to established regulations by a recognised assessment body using related practical and written test items from Item bank
Minimum required tools/ equipment/ implements or equivalent	bucket, knives, refrigerators, rackers, gumboots, masks, weighing scale, transport means, sauce pans, trays, water holding containers, driers, computer, mobile phones.
Minimum required materials and consumables or equivalent	pens, record books, packs, labels, water, rulers, pencil, disinfectants, gloves
Special notes	The theory must be integrated into the practice during training

3.0 ATP-PART III

Assessment Instruments for a MUSHROOM FARMER

- 3.1 Assessment of occupational competence is the procedure by which evidence is gathered and judged to decide if an individual (candidate) has met the stipulated assessment standards or not. In this ATP the **standards** to assess occupational competences are reflected in the form of the Occupational Profile and related Test Items.
- 3.2 Assessment of occupational competence should comprise both practical (performance) testing and written (theory/knowledge) testing.
- 3.3 Based on the Occupational Profile, a combined panel of job practitioners and Instructors developed a substantial number of test items for assessing (practical) performance as well as items for assessing occupational knowledge (theory) all stored in an electronic Test Item Bank (TIB) at Directorate of Industrial Training.
- 3.4 Performance (Practical) Test Items (PTI) are closely related to typical work situations in Ugandan business and manufacturing enterprises. They comprise a test assignment for candidates and assessment criteria and/or scoring guides for assessors' use.
- 3.5 Written Test items (WTI) for written testing of occupational theory, (knowledge) are presented in different forms which include:
 - Short answer test items.
 - Multiple choice test items and,
 - Matching test items, These WTIs herein focus on functional understanding as well as trouble-shooting typically synonymous with the world of work.
- 3.6 Composition of assessment / test papers will always require good choices of different types of WTI in order to ensure the assessment of relevant occupational knowledge required of candidates to exhibit competence.
- 3.7 The test items contained in the Test Item Bank may be used for continuous / formative assessment during the process of training as well as for summative assessment of candidates who have acquired their competences non-formally/or informally.
- 3.8 In this document, the following samples of test items for assessing both performance (practical) and occupational knowledge (theory) of a **MUSHROOM FARMER** are included:

3.9 Overview of Test Item samples included:

No.	Type of Test Item	Numbers included
1	Written (Theory)- short answer	3
2.	Written (Theory)- multiple choice	3
3.	Written (Theory)- matching item- generic	2
3.	Written (Theory)- matching item- cause and effect	2
4.	Written (Theory)- matching item (work sequence)	2
5.	Performance (practical) test items	2
	Total	14

WRITTEN TEST ITEMS (SAMPLES)

DIT/ QS	Test Item Database Written (Theory) Test Item- no. 1			
Occupational Title:	Mushroom Farmer			
Competence level:	1			
Code no.				
Test Item type:	Short answer	√		
	Multiple choice			
	Matching item	Generic	Cause- Effect	Work-sequence
Complexity level:	C1			
Date of OP:	August 2020			
Related module:	M1.3			
Time allocation:	3 minutes			

Test Item	State three natural conditions that must be controlled during mushroom growth.
Answer spaces	(i) (ii) (iii)
Expected key (answers)	(i) Humidity (ii) Aeration (iii) Light (iv) Temperature

DIT/ QS	Test Item Database Written (Theory) Test Item- no. 2			
Occupational Title:	Mushroom Farmer			
Competence level:	1			
Code no.				
Test Item type:	Short answer	√		
	Multiple choice			
	Matching item	Generic	Cause-Effect	Work-sequence
Complexity level:	C2			
Date of OP:	August 2020			
Related module:	M 1.3			
Time allocation:	4 minutes			

Test Item	Give four measures that mushroom farmers should carryout in order to manage mushroom infections.
Answer spaces	(i) (ii) (iii) (iv)
Expected Key (answer)	(i) Disinfect the mushroom house (ii) Disinfect equipment and tools (iii) Sterilise substrates (iv) Clean working areas (v) Proper disposal of infected gardens (vi) Maintain personal hygiene (vii) Observe bio-security measures

DIT/ QS	Test Item Database Written (Theory) Test Item- no. 3			
Occupational Title:	Mushroom Farmer			
Competence level:	1			
Code no.				
Test Item type:	Short answer	√		
	Multiple choice			
	Matching item	Generic	Cause-Effect	Work-sequence
Complexity level:	C1			
Date of OP:	August 2020			
Related module:	M 1.2			
Time allocation:	4 minutes			

Test Item	List four practices done during preparation of mushroom substrates.
Answer spaces	(i) (ii) (iii) (iv)
Expected Key (answer)	(i) Sorting (ii) Soaking (iii) Drainage (iv) Fermentation (v) Sterilisation

DIT/ QS		Test Item Database Written (Theory) Test Item- no. 4			
Occupational Title:	Mushroom Farmer				
Competence level:	1				
Code no.					
Test Item type:	Short answer				
	Multiple choice	√			
	Matching item	Generic	Cause-Effect	Work-sequence	
Complexity level:	C2				
Date of OP:	August 2020				
Related module:	M1.2				
Time allocation:	2 minutes				

Test Item	Which of the following materials neutralises the pH of mushroom substrates.
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Answer spaces	<ul style="list-style-type: none"> A. Sodium hypochlorite B. Methylated spirit C. Calcium carbonate D. Methyl bromide
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Key (answer)	C
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DIT/ QS		Test Item Database Written (Theory) Test Item- no.5			
Occupational Title:	Mushroom Farmer				
Competence level:	1				
Code no.					
Test Item type:	Short answer				
	Multiple choice	√			
	Matching item	Generic	Cause-Effect	Work-sequence	
Complexity level:	C1				
Date of OP:	August 2020				
Related module:	MI.2				
Time allocation:	2 minutes				

Test Item	The practice of mixing spawn with substrates is called.....
Distractors and correct answers	A. Inclusion B. Induction C. Supplementation D. Inoculation

Key (answer)	D
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DIT/ QS	Test Item Database Written (Theory) Test Item- no. 6			
Occupational Title:	Mushroom Farmer			
Competence level:	1			
Code no.				
Test Item type:	Short answer			
	Multiple choice	√		
	Matching item	Generic	Cause-Effect	Work-sequence
Complexity level:	C1			
Date of OP:	August 2020			
Related module:	MI.3			
Time allocation:	2 minutes			

Test Item	What practice is used in opening mushroom gardens to allow fruiting?
Distractors and correct answers	A. Slitting B. Perforation C. Pricking D. Punching

Key (answer)	A
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DIT/ QS		Test Item Database Written (Theory) Test Item- no. 7			
Occupational Title:	Mushroom Farmer				
Competence level:	1				
Code no.					
Test Item type:	Short answer				
	Multiple choice				
	Matching item	Generic	Cause-Effect	Work-sequence	
		√			
Complexity level:	C2				
Date of OP:	August 2020				
Related module:	M1.2				
Time allocation:	4 minutes				

Test Item	Match the following materials in column A to their functions in column B during post-harvest handling of oyster mushrooms.
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Column A (Materials)	
1	Heat source
2	Lime
3	Supplement
4	Water

Column B (Functions)	
A	For sterilisation
B	Adds moisture to content
C	For aeration
D	Neutralises substrates pH
E	Controls light
F	Increases nutrient content

Key (answer)	1:A, 2:D, 3:F, 4:B
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DIT/QS	Test Item Database Written (Theory) Test Item- no. 8			
Occupational Title:	Mushroom Farmer			
Competence level:	1			
Code no.				
Test Item type:	Short answer			
	Multiple choice			
	Matching item	Generic	Cause-Effect	Work-sequence
		√		
Complexity level:	C2			
Date of OP:	August 2020			
Related module:	M1.4			
Time allocation:	4 minutes			

Test Item	Match the following materials, tools and equipment to their functions in post-harvest handling of oyster mushrooms.
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Column A (Materials)	
1	Basket
2	Methylated spirit
3	Solar drier
4	Polythene bag

Column B (Functions)	
A	Preservation
B	Packaging
C	Carrying harvest
D	Disinfection
E	Plucking
F	Cleaning

Key (answer)	1:C, 2: D, 3:A,4:B
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DIT/ QS		Test Item Database Written (Theory) Test Item- no. 9			
Occupational Title:	Mushroom Farmer				
Competence level:	Level 1				
Code no.					
Test Item type:	Short answer				
	Multiple choice				
	Matching item	Generic	Cause-Effect	Work-sequence	
			√		
Complexity level:	C2				
Date of OP:	August 2020				
Related module:	MI.3				
Time allocation:	5 minutes				

Test Item	Match the following conditions in mushroom growing in column A with their effects in column B.
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Column A (Conditions)	
1	Low moisture content
2	Poor sterilisation
3	High moisture content
4	Poor aeration

Column B (Effects)	
A	Small caps and long stems
B	Partially colonised garden
C	Soggy mushrooms
D	Green mould
E	Dry Garden
F	Poor colouring of mushrooms

Key (answer)	1:E, 2:D, 3:C, 4:A
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DIT/ QS		Test Item Database Written (Theory) Test Item- no. 10			
Occupational Title:	Mushroom Farmer				
Competence level:	Level 1				
Code no.					
Test Item type:	Short answer				
	Multiple choice				
	Matching item	Generic	Cause-Effect	Work-sequence	
			√		
Complexity level:	C2				
Date of OP:	August 2020				
Related module:	MI.4				
Time allocation:	5 minutes				

Test Item	Match the following post-harvest handling practices with their corresponding outcome.
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Column A (Practice)	
1	Pack mushrooms
2	Clean mushrooms
3	Weigh mushrooms
4	Preserve mushrooms

Column B (Outcome)	
A	Ease handling
B	Reduce production costs
C	Increase shelf life
D	To determine price
E	Removing foreign material
F	Improves flavour

Key (answer)	1:A, 2:E, 3:D, 4:C
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DIT/ QS	Test Item Database Written (Theory) Test Item- no. 11				
Occupational Title:	Mushroom Farmer				
Competence level:	1				
Code no.					
Test Item type:	Short answer				
	Multiple choice				
	Matching item	Generic	Cause-Effect	Work-sequence	
				√	
Complexity level:	C 2				
Date of OP:	August 2020				
Related modules:	M1.4				
Time allocation:	5 minutes				

Test Item	Sequence the following activities performed in harvesting of oyster mushrooms.
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Column A (order)	Column B	
1 st	A	Clean mushrooms
2 nd	B	Sort mushrooms
3 rd	C	Take record of harvested mushrooms
4 th	D	Identify harvesting tools, equipment and materials
5 th	E	Weigh mushrooms
6 th	F	Identify mature mushrooms
7 th	G	Pluck mushrooms

Key (answer)	1:D, 2:F, 3:G, 4:A, 5:B, 6:E, 7:C
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DIT/ QS		Test Item Database Written (Theory) Test Item- no. 12			
Occupational Title:	Mushroom Farmer				
Competence level:	Level 1				
Code no.					
Test Item type:	Short answer				
	Multiple choice				
	Matching item	Generic	Cause-Effect	Work-sequence	
				√	
Complexity level:	C2				
Date of OP:	August 2020				
Related module:	MI.I				
Time allocation:	5 minutes				

Test Item	Re-arrange the steps of constructing a mushroom house below in their chronology.
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Column A (order)	Column B (work steps)	
1 st	A	Determine farm layout
2 nd	B	Secure construction materials
3 rd	C	Erect structure
4 th	D	Select site
5 th	E	Determine structure design

Key (answer)	1:D, 2:E, 3:A, 4:B, 5:C
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PERFORMANCE TEST ITEMS

DIT/ QS	Test Item Database Performance Test Item- no.13
Occupational Title:	Mushroom Farmer
Competence level:	1
Code no.	
Test Item:	Harvest, sort and grade 500gm of fresh oyster mushroom and pack them in quantities of 250 gm per pack.
Complexity level:	P.3
Date of OP:	August 2020
Related modules:	M1.4
Related skills and knowledge:	maturity indicators of mushrooms, weighing techniques, packing method, harvesting techniques, sorting methods, tools, materials and their usage, record keeping, sterilisation methods, ICT, cleaning of mushrooms, waste management, measurements and dimensions, food handling techniques.
Required tools, Materials and Equipment:	basket, saucepans, gloves, knives, cleaning towels, packs, gum boots, disinfectant, head gear, face masks, computer, table, weighing scale, stationery, waste bins, overall, overcoat.
Time allocation:	3hrs
Preferred venue:	Mushroom farm
Remarks for candidates	Avail protective gear, observe health, safety and environmental precaution
Remarks for assessors	Provide tools, materials and equipment listed above
Special notes	

#	Assessment criteria	Scoring guide	Max. Score	
			Process	Result
1	Preparation for the task	Identified tools, materials and equipment		1
		Assembled tools, materials and equipment	1	
		Assembled tools, materials and equipment observed		2
		<u>Wore protective gear</u>		1
		Overall		1
		Gum boots		1
Head gear		1		
Hand gloves		1		
Face masks		1		
		Disinfected tools, materials and equipment	2	
2	Harvesting of mushrooms	Identified mushrooms to harvest	2	
		Plucked mushrooms	2	
		Mature plucked mushrooms observed		2
		Residue free mushroom garden observed		3
3	Cleaning of mushrooms	Transferred harvested mushrooms to cleaning room	2	
		Wholesome mushrooms observed		2
		Cleaned mushrooms	3	
		Dirt free mushrooms observed		2
		Mushroom without stalk bases observed		2
4	Sorting of mushrooms	Sorted mushrooms	2	
		Damage free mushrooms observed		2
5	Grading of mushrooms	Graded mushrooms in different sizes	1	
		Mushrooms of similar sizes in different containers observed		1
6	Weighing of mushrooms	Weighed harvested mushrooms	2	
		Recorded the quantity of mushrooms	3	
		500g of fresh oyster mushrooms verified		2

#	Assessment criteria	Scoring guide	Max. Score	
			Process	Result
7	Packing of the mushrooms	Divided the harvest into two equal parts	2	
		Packed mushrooms in two packs	2	
		Two 250g packs of fresh oyster mushroom verified		2
8	Demobilized Resources	Cleaned tools and equipment	2	
		Dirt free tools and equipment observed		2
		Stored tools, remaining materials and equipment		2
		Removed personnel protective gear		2
	TOTAL		26	32
	MAXIMUM SCORE (Y)	X/Y X100	58	

DIT/ QS	Test Item Database Performance Test Item- no.14
Occupational Title:	MUSHROOM FARMER
Competence level:	Level 1
Code no.	
Test Item:	Prepare a mushroom garden for inoculation
Complexity level:	P.2
Date of OP:	August 2020
Related module:	M1.2
Related skills and knowledge:	Types of substrates, soaking substrates, sorting substrates, sterilisation methods, drainage techniques, substrate fermentation techniques, supplementation techniques, types of supplements, pH management, quality spawn, inoculation techniques, packaging materials, source of spawn, sources of substrates, characteristics of quality substrates, usage of tools, materials and equipment, sanitation criteria, disinfection materials and procedures, measurement and dimensions, numeracy and literacy.
Required tools, Materials and Equipment:	sterilising containers, soaking containers, tarpaulin, spade, substrates, jerry can, panga, strings, lime, needles, polythene bags, spawn, heat source, disinfectants, knife, blades, rings, supplements, broom, thermometers, weighing scale, plastic plates, beakers, PPEs.
Time allocation:	4hrs
Preferred venue:	Mushroom facility
Remarks for candidates	<ul style="list-style-type: none"> • Observe safety precautions • Must carry PPEs
Remarks for assessors	<ul style="list-style-type: none"> • Must wear PPEs • Provide required tools, materials and equipment listed above. • Cotton husks should be used as substrate • sterilised bagged substrates (done for 6hrs) should be provided

#	Assessment criteria	Scoring guide	Max. Score	
			Process	Result
1	Preparation for task	Wore protective gear <ul style="list-style-type: none"> • Gum boots • Overall • Gloves • Head gear • Nose mask 		1
				1
				1
				1
				1
				1
		Assembled tools, materials and equipment	2	
		Assembled tools, materials and equipment observed		1
		Cleaned tools and equipment	2	
		Dirt free tools and equipment observed		2
		Cleaned working area	3	
2	Preparation for inoculation	Drained substrate	2	
		Drained substrate without dripping water verified		2
		Supplemented substrate	2	
		Tested pH level	2	
		pH levels of range 6-8 verified		2
		Bagged substrate		2
		Transferred substrates to inoculation room	2	
3	Inoculation of substrate	Cooled substrate	1	
		Substrate at room temperatures verified		1
		Apportioned spawn to relatively smaller size	3	
		Mixed spawn and substrates in ratio 1:4	4	
		Tied and perforated garden	3	
		Garden tightly tied and perforated verified		2
4	Demobilize resources	Gathered tools and equipment		2

#	Assessment criteria	Scoring guide	Max. Score	
			Process	Result
		Cleaned tools and equipment	2	
		Dirt free tools and equipment		1
		Stored tools	1	
		Removed personnel protective gear		2
	TOTAL		29	22
	MAXIMUM SCORE (Y)	$\frac{X}{100}$	51	

4.0 ATP- PART IV

INFORMATION ON DEVELOPMENT PROCESS

4.1 Occupational Profile Developed (August 2020)

The Occupational Profile was exclusively developed by job practitioners who were working in the Mushroom Farmer occupation. The job expert panel, guided by UVQF Facilitators defined duties and tasks performed and provided additional generic information regarding the occupation.

4.2 Training Module Development (August 2020)

Based on the Occupational Profile for Mushroom Farmer of August 2020, Training Modules were developed by job practitioners, guided by UVQF Facilitators.

4.3 Test Item Development (September 2020)

Based on the Occupational Profile for Mushroom Farmer of August 2020, and Training Modules, Test Items were reviewed by combined panels of instructors and job practitioners, guided by UVQF Facilitators.

4.4 Methodology

The rationale for the Assessment and Training Package review was to link Vocational Education and Training to the real world of work by bridging Occupational Standards to Training Standards through industry-led Standards-Based Assessment.

Active participation of both instructors and job practitioners' panels consolidated the review philosophy.

The panelists worked as teams in workshop settings complemented by off-workshop field research and literature review activities including international benchmarking.

4.5 Development Panel

The participating panel of Job Practitioners required for different stages of the Assessment and Training Package i.e. Occupational Profile, Training Modules, Assessment Instruments were constituted by members from the following organisations.

No.	Name	Institution/ Organisation
1.	Mr. Akankwasa Pius	Local Farmer
2.	Ms. Mayambala Jennifer	Uganda Industrial Research Institute (UIRI)
3.	Mr. Kamuntu Edgar	Global Agro Ent Ltd
4.	Mr. Nkugwa Edward	Lubiri Secondary School
5.	Mr. Sedikadiwa K. James	National Curriculum Development Center (NCDC)
6.	Ms. Abenakyo Faith	St. Mary's College Kisubi (SMACK)
7.	Mr. Tukwasibwe William	Global Agro Ent Ltd
8.	Mr. Naturinda Movadi	Masaka Secondary School
9.	Ms Kyokwijuka Immaculate	Lommtu Unique Supplies Ltd
10.	Mr. Okonye Xavier	Kibibi Secondary School
11.	Mrs. Atugumya Pheonah	Paac Mushroom Growers
12.	Ms. Lule Esther	Fraster Mushrooms
13.	Mr. Kiddu Abel	African Mushroom Growers (U) Ltd
14.	Mr. Musasane Amblose	Local Farmer
15.	Ms. Atuhire Eunice	Local Farmer

4.6 Quality check panel

No.	Name	Organisation
1.	Sendikaddiwa James Kajubi	NCDC
2.	Aryatuha Ronnet	DIT
3.	Ssentongo Simon Peter	DIT
4.	Sempala Patrick	MoES
5.	Mugabe Brian	DIT
6.	Mulumba Mathais Mutema	NCDC

4.7 Facilitator team

This Assessment and Training Package was Developed by a Facilitator team listed below:

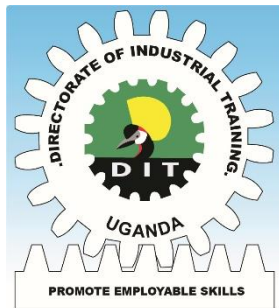
1. **Team Leader:** Ms. Mukyala Ruth, Ag Deputy Director, DIT
2. **Facilitators:** Ms. Komugisha Noeline, PQO, DIT, Ms. Nakimuli Patra, Mr. Benjamin Alex Kibira
3. **Quality check facilitator:** Ms. Asiimwe Moreen
4. **Data Entrants:** Ms. Asiimwe Mashaija Sarah, Ongom Augustine, Nakato Annet, Nampijja Janat and Kirabo Tom
5. **Compiled by:** Ms. Nakimuli Patra, Atai Sarah QS DIT, Ninsiima Isabella QS DIT.
6. **Edited by:** Ms. Mukyala Ruth Ag. DD, DIT, QS Dept. DIT
7. **Coordinated by:** Mr Byakatonda Patrick, Ag. Director, DIT and Ms. Mukyala Ruth Ag. DD, DIT

4.8 Reference time:

The Assessment and Training Package was compiled in December 2020 and may be periodically revised to match the dynamic trends in the occupation and hence issued in different versions:

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