

Model Curriculum

Village Water Technician

SECTOR: AGRICULTURE & ALLIED
SUB-SECTOR: Forestry, Environment & Renewable
Energy Management
OCCUPATION: Watershed Management
REF ID: AGR/Q6602
NSQF LEVEL: 4



Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

AGRICULTURE SKILL COUNCIL OF INDIA

for the


MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/Qualification Pack: **'Village Water Technician'** QP No. **'AGR/Q6602 NSQF Level 4'**

Date of Issuance: November 10th, 2016

Valid up to: March 31st, 2019

* Valid up to the next review date of the Qualification Pack



Authorised Signatory
(Agriculture Skill Council of India)

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Village Water Technician

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Village water Technician”, in the “Agriculture & Allied” Sector/Industry and aims at building the following key competencies amongst the learner

Program Name	Village Water Technician		
Qualification Pack Name & Reference ID.	AGR/Q6602		
Version No.	1.0	Version Update Date	
Pre-requisites to Training	12 th Standard Passed		
Training Outcomes	<p>After completing this programme, participants will be able to:</p> <ul style="list-style-type: none"> • Understand the type and objective of different WHS: Different types of earthen dam such as percolation tank and micro irrigation tank, Farm pond/Dugout Pond, Stop dam/Check dam/Spillway, use and benefits of WHS • Identify the appropriate site for WHS: Understand the slope and topography of site, Basic technical parameter for deferent WHS • Understand Design & make layout plan for WHS: assist in designing & undertake land survey etc • Undertake construction of WHS: preparation of site, estimation of quantity of required material, availability of local material, maintaining side slope, compaction methods, settlement of material etc. • Understand the Map and drawing: topographical map, Cadastral map, Village resource map, Technical drawing of WHS etc. • Lay the Micro irrigation system: Crop water budgeting, Use of and efficiency of different Micro irrigation system, Laying of drip and sprinkler system. • Measure work and prepare bill: Schedule of rate, length, area and volumetric measurement, Bill preparation. • Undertake repair and maintenance of WHS & MIS: the cause of failure of WHS & MIS, Importance of ownership of beneficiary. • Maintain Technical Records and register: maintaining muster roll, Voucher, Material at site register, Stock register, Measurement book, Bill of quantity etc. • Understand the challenges before, during and after construction: social and economical dimension of village, Labour management, progress of work, time management, material management, onsite technical problems etc. • Understand measures related to health & safety at work place: Well versed with health and safety measures in terms of personal as well as others' safety. 		

This course encompasses 4 out of 4 National Occupational Standards (NOS) of “Village Water Technician” Qualification Pack issued by “Agriculture Skill Council of India”.

Sr. No.	Module:	Key Learning Outcomes	Equipment Required
1	<p>Introduction</p> <p>Theory Duration (hh:mm) 02:00</p> <p>Field visit of successful watershed (hh:mm) 05:00</p> <p>Film dissemination on basic principle of watershed (hh:mm) 01:00</p> <p>Corresponding NOS Code Bridge Module</p>	<ul style="list-style-type: none"> Understand General Discipline in the class room (Do's & Don'ts) Study the Scope & importance of Watershed in India Understand different Participatory Watershed Management Approaches Understand watershed approach and characteristic of watershed management Understand the Role of a Watershed Assistant 	Laptop, white board, marker, projector, Audio-visual aids, DVD Basic Principle of Watershed
2	<p>Introduction to Basic shape and measurement unit</p> <p>Theory Duration (hh:mm) 16:00</p> <p>Practical Duration (hh:mm) 00:00</p> <p>Corresponding NOS Code Bridge Module</p>	<ul style="list-style-type: none"> Understand and identify basic shape Measure and calculate length, area and volume of basic shape. Learn conversion of different measurement units and their use during implementation. 	Laptop, white board, marker, projector
3a	<p>Carry out construction of water harvesting structures (WHS)</p> <p>Theory Duration (hh:mm) 08:00</p> <p>Practical Duration (hh:mm) 16:00</p> <p>Corresponding NOS Code AGR / N6604</p>	<ul style="list-style-type: none"> Identify & survey the possible sites for WHS mark the layout of the WHS on the ground as per design provided by the watershed engineer Organize inputs, allocate work and resolve conflicts at the work site <p>Slope and contour Identification:</p> <ul style="list-style-type: none"> Understand slope and contour Construct A-Frame and Hydrometer using local material Conduct survey and identify slope 	Laptop, white board, marker, projector, Plumb bob, Stick, meson level pipe, white powder etc.

Sr. No.	Module:	Key Learning Outcomes	Equipment Required
		and contour	
3b	Carry out construction of water harvesting structures (WHS) Theory Duration (hh:mm) 08:00 Practical Duration (hh:mm) 04:00 Corresponding NOS Code AGR / N6604	Different types of map: <ul style="list-style-type: none"> • Understand different types of map and sketches • Understand component of map • Read and understand Resource map (PRA map), Cadastral map, Topographical map, Landuse map. • Calculate Slope through topographical map • Demarcate watershed on toposheet • Calculate area of watershed using graph paper 	Laptop, white board, marker, projector, Resource map, Cadastral map, Topographical map, Landuse map
3c	Carry out construction of water harvesting structures (WHS) Theory Duration (hh:mm) 03:00 Practical Duration and Exposure Visit (hh:mm) 06:00 Film dissemination (hh:mm) 01:00 Corresponding NOS Code AGR / N6604	Planning, Layout and construction of Farm pond: <ul style="list-style-type: none"> • Understand the objective of a farm pond • Learn the concept of 5 percent model • Select location of Farm pond • Undertake Layout/Markout of Farm pond • Construct farm pond following step by step procedure • Understand Do's and don't during planning and execution of farm pond 	Laptop, white board, marker, projector, White powder, Rope, pegs, measuring tape, Reading material, Audio-visual aids, DVD of Farm pond
3d	Carry out construction of water harvesting structures (WHS) Theory Duration (hh:mm) 07:00 Practical Duration (hh:mm) 14:00 Film dissemination (hh:mm) 1:00	Planning, Layout and construction of Earthen Dam: <ul style="list-style-type: none"> • Understand the objective of a earthen dam • Select location of earthen dam • Understand main component of an earthen dam • Undertake Layout/Markout of earthen dam • Construct earthen dam following step by step procedure • Understand Do's and don't during planning and execution of earthen dam 	Laptop, white board, marker, projector, White powder, Rope, pegs, measuring tape, Reading material, Audio-visual aids, DVD of Earthen dam

Sr. No.	Module:	Key Learning Outcomes	Equipment Required
	Corresponding NOS Code AGR / N6604		
3e	Carry out construction of water harvesting structures (WHS) Theory Duration (hh:mm) 08:00 Practical Duration (hh:mm) 08:00 Corresponding NOS Code AGR / N6604	Planning Layout and construction of Stop dam/Check dam/spillway: <ul style="list-style-type: none"> • Understand the objective of a stop dam • Select location of stop dam • Understand main component of an stop dam • Undertake Layout/Markout of stop dam • Construct stop dam by following step by step procedure • Understand Do's and don't during planning and execution of stop dam 	Laptop, white board, marker, projector, White powder, Rope, pegs, measuring tape
4a	Carry out water budgeting of the watershed and promotion of micro-irrigation systems (MIS) Theory Duration (hh:mm) 16:00 Field visit of nearest Meteorological station (hh:mm) 05:00 Practical Duration (hh:mm) 00:00 Corresponding NOS Code AGR / N6605	Water budgeting in Watershed: <ul style="list-style-type: none"> • Understand requirement of water budgeting in Watershed • Understand factors affecting water budgeting and components of water budgeting • Understand Rain fall, Runoff, Run off coefficient, Water cycle • Record daily rainfall (mm) data on status of water stored in WHS in watershed • Calculate Runoff • Estimate water requirement for drinking, domestic purposes, livestock and different crops • Prepare water budget of watershed and display at public place • Present water budget in front of Gram Sabha and community 	Laptop, white board, marker, projector, Audio-visual aids,
4b	Carry out water budgeting of the watershed and promotion of micro-irrigation systems (MIS) Theory Duration (hh:mm) 10:00 Practical Duration and field exercise	Survey and installation of micro irrigation systems: <ul style="list-style-type: none"> • Survey land use and agriculture practices using net planning • Understand different types of micro irrigation system and its benefits • Install drip system • Maintain drip system • Install sprinkler • Maintain sprinkler • Understand common problems in micro irrigation system 	Laptop, white board, marker, projector, Audio-visual aids,

Sr. No.	Module:	Key Learning Outcomes	Equipment Required
	(hh:mm) 15:00 Corresponding NOS Code AGR /N6605	<ul style="list-style-type: none"> Understand Do's and don'ts in planning and execution Train the farmer on-farm on operating and maintaining the MIS 	
5a	Carry out repairs and maintenance of the WHS and MIS Theory Duration (hh:mm) 06:00 Practical Duration and field visit to weather station (hh:mm) 05:00 Corresponding NOS Code AGR / N6606	<ul style="list-style-type: none"> Record rainfall Maintain rain gauge station Record Water levels of corresponding well and tube well Undertake regular survey/ monitoring of WHS to verify any physical damage or probable hazards Prepare repair plan & get fund approval from the watershed committee for repair works 	Laptop, white board, marker, projector, Audio-visual aids
5b	Carry out repairs and maintenance of the WHS and MIS Theory Duration (hh:mm) 10:00 Practical Duration (hh:mm) 10:00 Corresponding NOS Code AGR / N6606	<ul style="list-style-type: none"> Maintain the water harvesting structures Fix and remove gate shutter of stop dam Clear obstacles from exit and gate of stop dam Identify reason of damage or failure of structure Find scope of repair Estimate the material requirement for repair and prepare plan Undertake repair & maintenance works Coordinate with farmers & MIS company staff for smooth function of MIS 	Laptop, white board, marker, projector, Audio-visual aids,
6	Keep records and write reports related to WHS and MIS Theory Duration (hh:mm) 06:00 Practical Duration (hh:mm) 10:00 Corresponding NOS Code AGR / N6607	<ul style="list-style-type: none"> Understand need for record keeping Understand types of registers and format for record keeping Maintain Attendance book Maintain Measurement book Maintain Material at site register and stock register Maintain Muster roll Undertake regular field surveys and take appropriate observations/record/data Assess social and economical benefits of water harvesting structure 	Laptop, white board, marker, projector, Audio-visual aids,

Sr. No.	Module:	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> Prepare Field visit reports Present benefits in front of Gram sabha and community 	
7	Soft Skills/ Computer Literacy/ Financial Literacy/Entrepreneurship Skills Theory Duration (hh:mm) 20:00 Practical Duration (hh:mm) 40:00 Corresponding NOS Code	<ul style="list-style-type: none"> Basic Communication & Presentation Skills Organizational Skills Basic Computer Skills Various types of documents and their uses- Birth certificate, 10th Certificate, Ration Card, Voter Id Card, Aadhar Card, PAN card, Driving License, Bank Pass Book etc Various types of loan/credit available (relevant to the trainees' requirement) and the process to avail the same 	Computer, Audio-visual aids, Projector
8	Total Duration: Theory Duration (hh:mm) 120:00 Practical Duration (hh:mm) 140:00	Unique Equipment Required: Laptop, white board, marker, projector, Audio-visual aids, computer, Mason Pipe, Wooden pole for Pipe level and A-frame construction, Plum bob, Measuring tap 30M, Calculator, Survey of India Topo Sheet, Cadastral Map, Sketch Pen, Graph Paper, L-scale, Hammer, Internet connection	

Grand Total Course Duration: **260 Hours, 0 Minutes**

(This syllabus/ curriculum has been approved by [Agriculture Skill Council of India](#))

Trainer Prerequisites for Job role: “Village Water Technician” mapped to Qualification Pack: “AGR/Q6602, v1.0”

Sr. No.	Area	Details
1	Description	Trainer is responsible for educating the trainees – Different components of WHS and Micro Irrigation system, Planning, construction, repair and maintenance of WHS, keeping record, Safety & hygiene at the workplace.
2	Personal Attributes	Trainer should be Subject Matter Expert. He/ she should have good communication, leadership, observation and practical oriented skills.
3	Minimum Educational Qualifications	Bachelor’s Degree, Preferably in Agriculture/Civil Engineer
4a	Domain Certification	Certified for Job Role: “Village Water Technician” mapped to QP: “AGR/Q6602, v1.0”. Minimum accepted score is 80%.
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “SSC/Q1402”. Minimum accepted % as per respective SSC guidelines is 70%.
5	Experience	<ul style="list-style-type: none"> • B-Tech or BE in Agriculture or civil engineering with 3 Years relevant experience • M. Sc.(Agriculture) with 5 Years experience in watershed management • Any Graduate with 5+ years experience in watershed management

Annexure: Assessment Criteria

Assessment Criteria	
Job Role	Village Water Technician
Qualification Pack	AGR/Q6602
Sector Skill Council	Agriculture

Sr. No.	Guidelines for Assessment
1	Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2	The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre(as per assessment criteria below)
4	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria
5	To pass the Qualification Pack, every trainee should score a minimum of 70% in aggregate
6	In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack

Assessable outcomes	Assessment criteria	Total Marks	Out Of	Theory	Skills Practical
1. AGR/Q6604: Carry out construction of water harvesting structures	PC1. identify basic technical parameter for different types of WHS such as		10	4	6
	<ul style="list-style-type: none"> suitability and feasibility of the WHS-site selection procedure 				
	<ul style="list-style-type: none"> surveying equipment and survey of the WHS site 				
	<ul style="list-style-type: none"> shape, dimensions and benefits of the WHS 				
	PC 2. identify the possible sites/ locations on major drainage lines/ nallas for construction of WHS across the watershed area considering parameters such as:		10	4	6
	<ul style="list-style-type: none"> slope of the nalla bed towards upstream of line of construction 				
	<ul style="list-style-type: none"> width of nalla bed at line of construction 				
	<ul style="list-style-type: none"> scope for maximum water storage capacity and submergence details 				
	<ul style="list-style-type: none"> availability of proper foundation and type soil strata 				
	<ul style="list-style-type: none"> availability of the space for emergency spillway/ surplusing arrangement 				
<ul style="list-style-type: none"> catchment area and its characteristics 					
<ul style="list-style-type: none"> opportunity for benefits to the adjoining farmers or villagers and their readiness to participate and offer area for submergence 					
	PC3. organize visit of the watershed engineer along with the concerned farmers and committee members to the proposed site/ location of WHS to finalize the site		8	2	6
	PC4. collect the necessary data for the design purpose from primary and secondary sources such as:		10	3	7
	<ul style="list-style-type: none"> topo sheet and revenue map 				
	<ul style="list-style-type: none"> rainfall and temperature data 				

	<ul style="list-style-type: none"> cropping pattern and production data of surrounding farmers 			
	<ul style="list-style-type: none"> catchment area details according to land use 			
	<ul style="list-style-type: none"> baseline data on water levels in the nearby wells across season 			
	PC5. conduct topographic survey to draw the cross-section and longitudinal-section of nalla at the selected site for WHS	10	3	7
	<ul style="list-style-type: none"> divide the possible storage area with some additional area into grids of 5x5m or 10x10m as per requirement 			
	<ul style="list-style-type: none"> take levels of each grid point with respect to temporary bench mark (TBM) and note these in field book in proper manner 			
	<ul style="list-style-type: none"> in case of small WHS, take levels of line of construction and a line along the nalla bed to cover the storage at an interval of 5m or 10m 			
	PC6. motivate the land owners to participate in the construction of WHS through voluntary labour (shramdan) or cash/ kind contribution	10	3	7
	<ul style="list-style-type: none"> discuss the desired and possible benefits of WHS with farmers 			
	<ul style="list-style-type: none"> discuss area under submergence, its ownership and readiness of farmers to allow the submergence 			
	<ul style="list-style-type: none"> discuss expected contribution of benefitting farmers in WHS construction and maintenance in future 			
	PC7. mark the layout of the WHS on the ground as per design provided by the watershed engineer	8	2	6
	PC8. allocate the work appropriately to labour and monitor that the work is being done in a safe and proper manner	8	2	6
	PC9. monitor each and every parameter of qualitative construction under the guidance of watershed engineer	10	3	7
	<ul style="list-style-type: none"> clear and clean the site in a proper way and as required 			
	<ul style="list-style-type: none"> take appropriate care while using different tools and machines 			
	<ul style="list-style-type: none"> mix/ use construction material in right proportion and quantity 			

	<ul style="list-style-type: none"> allow proper settling time during the construction at proper levels 				
	<ul style="list-style-type: none"> ensure measurements are taken and photo documentation is done at different stages of construction 				
	PC10. organize and supply the desired quantity of the material and equipment required for the construction.		8	2	6
	PC11. report conflicts arising at the work site to the committee and manager and try to resolve them if possible		8	2	6
			100	30	70
2. AGR/Q6605: Carry out water budgeting of watershed and promotion of micro irrigation systems	PC1. visit rain gauge station daily and record the daily rainfall (mm) occurring in the watershed		6	2	4
	PC2. visit and collect the data on status of water stored in WHS in watershed		6	2	4
	PC3. survey the utilization pattern of the available water for drinking, domestic, irrigation and other purposes		7	2	5
	PC4. collect the data on crop types, area under cultivation, irrigations sources and methods in kharif, rabbi and summer seasons		7	2	5
	PC5. collect the data on livestock types and water utilization periodically		6	2	4
	PC6. prepare, update and display in the public place the water budget indicating available water, utilization pattern and balance available for next season under the guidance of the engineer		7	2	5
	<ul style="list-style-type: none"> total quantity of available water calculated based on rainfall, runoff and water in storage structures till date 				
	<ul style="list-style-type: none"> water already utilized for crops, livestock, domestic purposes and drinking 				
	<ul style="list-style-type: none"> balance quantity of available water and possibility of rainfall based on past data 				
	<ul style="list-style-type: none"> agreement on allocation of balance available water for drinking, domestic purposes, livestock and crops till the next rainfall/ monsoon season 				
<ul style="list-style-type: none"> crop planning and water saving technologies based on allocation 					

	PC7. explain the displayed water budget to the community from time to time and promote suitable water management techniques including crop pattern, crop area, micro-irrigation, etc.	7	2	5
	PC8. motivate the farmers to accept the micro-irrigation systems (MIS) such as drip, sprinkler, etc. as a tool to manage available water judiciously	7	2	5
	PC9. visit the farms and conduct the survey of these farms for MIS	7	2	5
	<ul style="list-style-type: none"> • details on irrigation source (well, tube well, pond, etc.) including water availability, lifting pump specifications and existing pipeline to find out sub-main required 			
	<ul style="list-style-type: none"> • measurement of the area of the plot where MIS is planned 			
	<ul style="list-style-type: none"> • planned crop details including row-to-row and plant-to-plant distance 			
	<ul style="list-style-type: none"> • measurement of length of each row to decide lateral length 			
	<ul style="list-style-type: none"> • locations for filter, fertigation kit, different valves, etc. 			
	PC10. discuss with the engineer and the farmer on the material quantity and price quotations received from the MIS dealers	7	2	5
	<ul style="list-style-type: none"> • quality and quantity of main and sub-main pipe, lateral drip lines etc. 			
	<ul style="list-style-type: none"> • type of water filter, ventury/ fertigation kit, different valves 			
	<ul style="list-style-type: none"> • cost comparison between different suppliers 			
	PC11. collect farmer's upfront contribution, if any, before purchase order is placed	7	2	5
	PC12. verify the quantity and quality of the laterals, drippers/ sprinklers and other fitting material before transporting these to the farms	7	2	5
	PC13. supervise laying of the pipes and laterals and other fittings as against the design given by the engineer	6	2	4
	PC14. test the working of MIS in front of the dealer and the farmer	6	2	4
	PC15. train the farmer on-farm on operating and maintaining the MIS	7	2	5
		100	30	70
3. AGR/Q6606: Carry out repair	PC1. pay visit to all the water harvesting structures at critical times such as heavy	12	4	8

and maintenance of the WHS and MIS	rainfall, flash floods, beginning and end of monsoon to verify the physical condition/ damages, functioning and possible hazards			
	PC2. take appropriate measurements of the non-performing or damaged structures to work out the maintenance and repair needs	12	4	8
	PC3. ensure that work is carried out in a manner with minimal environmental damage and work out appropriate solution on maintenance and repair the damages in consent with the adjoining farmers, the committee and engineer	12	4	8
	PC4. prepare the plan and estimate, present the same to the watershed committee and get fund approval for repairs	12	4	8
	PC5. carry out the necessary repair/maintenance operations on the structure	8	2	6
	PC6. visit the farmers using MIS at critical times such as laying of laterals at time of crop sowing, winding the system at the time of crop harvesting and complains received from the farmer	12	3	9
	PC7. identify common problems faced by the farmers during installation, retrieval or running of the system and report any accidents, incidents or problems without delay to an appropriate person and take necessary immediate action to reduce further danger	8	2	6
	PC8. supervise the system cleaning by acid treatment and other methods to remove the clogging	12	4	8
	PC9. help the farmers in getting support/ replacement in case of manufacturing and design defects from the MIS company staff	12	3	9
		100	30	70
4. AGR/Q6607: Keep records and write reports related to WHS and MIS	PC1. learn about the record maintenance need and formats on WHS	8	2	6
	PC.2 maintain the office file containing topographic survey, design and estimates, design drawings and maps of each WHS	8	2	6
	PC3. keep updating attendance book, measurement book (MB), payment muster and vouchers, material bills and inventory record and photographic evidences for each WHS (keep these in safe custody at committee office over the years even after closure of the project)	8	2	6

	PC4. display important data on designed dimensions, water storage and expenses at the WHS sites	7	2	5
	PC5. record the observations and feedback on WHS during the monitoring and inspection visits by the engineer and other visitors including the farmers	8	3	5
	PC6. collect the data on water and silt levels in the WHS, adjoining wells and irrigated area along with cropping system and production periodically	8	3	5
	PC7. prepare reports based on the visits and records as and when required	7	2	5
	PC8. learn about the record keeping need and formats on MIS	8	2	6
	PC9. maintain the office file containing field survey, design and estimates, design drawings and maps of each plot of MIS done by the watershed committee	8	2	6
	PC10. keep updating measurement book (MB), payment muster and vouchers, material bills and inventory record and photographic evidences for each MIS plot.	7	2	5
	PC11. record the observations and feedback on MIS during the monitoring and inspection visits by the engineer and other visitors including the farmers	8	3	5
	PC12. collect the data on irrigation efficiency on sample plots including cropping system and production periodically	8	3	5
	PC13. prepare reports based on the visits and records as and when required	7	2	5
		100	30	70
	TOTAL	400	120	280
	Percentage Weightage:		30%	70%
	Minimum Pass% to qualify (aggregate):		70%	