



Republic of Rwanda
Ministry of Education



RTB | RWANDA
TVET BOARD

Forest Management

FORFM502

Manage Forest

Competence

RQF Level: 5

Learning Hours: 60



Credits: 6

Sector: Agriculture and Food Processing

Trade: Forestry

Module Type: Specific

Curriculum: FORFM 5002 TVET Certificate V in Forestry

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Purpose statement	This module is reserved for level five (L5) forestry learners; it describes the skills, knowledge and attitudes required to manage forest. Up on completion of this module, the learners will be able to Plan forest management activities, implement forest management plan and value forest products. Qualified learner deemed competent may work in various places including open field and a range of tasks related to forest management. She/he can work alone with others under minimum supervision				
Learning assumed to be in place	<ul style="list-style-type: none"> - Apply basic of GIS and arc GIS in forestry - Basic knowledge on forest ecosystem and deontology 				
Delivery modality	Training delivery	100%	Assessment	Total 100%	
	Theoretical content	30%	Formative assessment	50% Group project and presentation Individual project /Work	
	Practical work:	70%			70%
	<ul style="list-style-type: none"> • Group project and presentation 30% • Individual project /Work 40% 				
				Summative Assessment	50%

Elements of Competency and Performance Criteria

Elements of competence	Performance criteria
1. Plan forest management activities	1.1. Resources are correctly mobilized based on type of task.
	1.2. Forest stand is properly assessed according to forest status.
	1.3. Forest management plan is properly developed referring to forest owner objectives.
2. Implement forest management plan	2.1. Tending operations are properly performed according to forest regime and development stage.
	2.2. Forest protection measures are appropriately applied based on types of hazards.
	2.3. Monitoring and evaluation are well conducted based on action plan.
3. Value forest	3.1. Forest road is properly stabilized in accordance with road embankment guidelines
	3.2. Forest inventory is properly conducted based on forest owner objectives, age and

products	composition.
	3.3. Value of forest products is properly determined based on categories of forest products.

Knowledge, Skills, and Attitude

Knowledge	Skills	Attitude
<ul style="list-style-type: none"> ✓ Description of forest ecosystem ✓ Description of forest management planning principles ✓ Identification of tree species ✓ Description of environmental safeguard procedures rules and regulations ✓ Description of data collection and analysis techniques ✓ Description of tree growth parameters ✓ Consultation of forest policy, laws, and regulations ✓ Description of forest management practices <p>Description of forest harvesting methods.</p>	<ul style="list-style-type: none"> ✓ Operating forest management tools and equipment. ✓ Monitoring and evaluation skills ✓ Application of tree feeling techniques ✓ Application of forest harvesting methods. ✓ Computer manipulation skills ✓ Collection of forest data ✓ Communication skills ✓ Leadership skills ✓ Forest data analysis skills ✓ Decision making skills 	<ul style="list-style-type: none"> ✓ Having the spirit of team working. ✓ Being a hard worker ✓ Having flexibility at workplace ✓ Having time manager attitude in forest activities. ✓ Being passionate to the workplace ✓ Being Self-confidence in planning forest activities. ✓ Good communication

Learning outcomes	At the end of the module the learner will be able to: 1. Plan forest management activities 2. Implement forest management plan 3. Valuate forest products
Learning outcome 1: Plan forest management activities	Learning hours: 15
Indicative content	
<ul style="list-style-type: none"> • Introduction to forest management <ul style="list-style-type: none"> ✓ Definition of forest management ✓ Forest components ✓ Principles of forest management • Mobilization of forest management resources <ul style="list-style-type: none"> ✓ Types of resources <ul style="list-style-type: none"> ✚ Tools ✚ Materials ✚ Equipment ✚ Human resources ✚ Financial means ✓ Types of forest management activities ✓ Assessment of forest stand ✓ Assessment approaches of forest stand • Forest stand characteristics <ul style="list-style-type: none"> ✚ Composition ✚ Age ✚ Size and density ✚ Site condition ✚ Forest structure ✚ Forest status ✚ Regimes ✚ Development stage • Description of forest stand assessment methodology <ul style="list-style-type: none"> ✓ Types of forest data ✓ Forest data collection methodology ✓ Selection factors of forest stand assessment methodology • Conducting forest stand assessment <ul style="list-style-type: none"> ✓ Data collection ✓ Data processing • Description of forest management plan <ul style="list-style-type: none"> ✓ Types of forest management plan ✓ Elements of forest management plan 	

<ul style="list-style-type: none"> ✓ Steps of management plan development ✓ Template of forest management plan • Elaboration of forest management plan <ul style="list-style-type: none"> ✓ Filling forest management plan template 	
Resources required for the learning outcome	
Equipment	GPS, dumpy level, clinometer, compass, computer, theodolite, digital camera, binocular, increment borer
Materials	Notebook, pens, pencils, paints,
Tools	Brush, forest caliper, tape measure, forest map, panga, forest management template, picture of forest stand, videos of forest management activities , internet
Facilitation techniques	<ul style="list-style-type: none"> • Demonstration by viewing videos and films, simulation, Individual and group work, Practical exercise, trainer guided and Group discussion, Oral presentation • Trainer announces the topic of the session to the learners • Trainer show the pictures/videos of forest stand to learners • Trainer ask the formed learner's groups to discuss on forest stand assessment • Learners are tasked to describe forest stand, identify the required resources, describe forest stand assessment methodology • Trainer present to the learners the data collection format and how to fill it • Trainer guide and facilitate the learners while performing their tasks on the class/field • Trainer invites one member from each group to present the group findings to others and he/she gives expert view by explaining more about the task and provides feedbacks to close the session
Formative assessment methods	<ul style="list-style-type: none"> • Written assessment • Oral presentation • Performance assessment

Learning outcome 2: Implement forest management plan	Learning hours:25
Indicative content	

- **Description of forest regimes**
 - ✓ High tree/full grown tree
 - ✓ Coppices wood
- **Description of forest growing stages**
 - ✓ Recruit
 - ✓ Cover
 - ✓ Low high forest
 - ✓ Young high forest
 - ✓ mature high forest
 - ✓ old high forest
- **Performing tending operations**
 - ✓ Weeding/clearing
 - ✓ Pruning
 - ✓ Thinning
 - ✓ Coppicing
- **Identification of forest hazards**
 - ✓ Physical hazards
 - ✓ Biological hazards
 - ✓ Natural hazards
- **Description of forest Pest and diseases**
 - ✓ Forest pests
 - ✓ Forest diseases
- **Applying forest protection measures**
 - ✓ Preventives measures
 - ✓ Curatives measures
- **Development of forest monitoring and evaluation plan**
 - ✓ Forest monitoring and evaluation tools
 - ✚ Template
 - ✚ Software
- **Conducting forest monitoring and evaluation**
 - ✓ Forest monitoring and evaluation procedures

Resources required for the indicative content

Equipment	GPS, computer, PPE
Materials	Notebook, pens, pencils, paints.
Tools	Brush, fire extinguisher, forest map, panga, template of monitoring plan, internet

Facilitation techniques	<ul style="list-style-type: none"> ● Demonstration by viewing videos and films, simulation, Individual and group work, Practical exercise, trainer guided and Group discussion, Oral presentation ● ● Trainer announces the topic of the session to the learners ● Trainer show the pictures/videos of forest growing stages to learners ● Trainer ask the formed learner’s groups to discuss on implantation of forest management plan ● Learners are tasked to perform tending, operations describe forest regimes and forest growing stages, identify forest hazards, describe pests and diseases apply, forest protection measures, develop forest monitoring and evaluation plan, conduct forest monitoring and evaluation ● Trainer guide and facilitate the learners while performing their tasks on the class/field ● Trainer invites one member from each group to present the group findings to others and he/she gives expert view by explaining more about the task and provides feedbacks to close the session
Formative assessment methods	<ul style="list-style-type: none"> ● Written assessment ● Oral presentation ● Performance assessment ● Product based assessment

Learning outcome 3: Valuate forest products	Learning hours: 20
Indicative content	

- **Assessment of forest road current status**
- **Estimation of forest road maintenance cost**
 - ✓ Maintenance expenses of forest road
 - ✚ Labor cost
 - ✚ Tools, materials and equipment cost
 - ✓ Elaboration of summary report for forest road cost
- **Description of forest inventory**
 - ✓ Types of forest inventory
 - ✓ Forest inventory methods
 - ✓ Forest inventory plan and timing
 - ✓ Conducting forestry resources inventory
 - ✚ Timber forest products
 - ✚ Non-timber forest products
 - ✚ Analyzing and interpretation of forest inventory data
- **Valuate of forest products**
 - ✓ Factors affecting forest value
 - ✚ Area (size)
 - ✚ Instructure(Access)
 - ✚ Site characteristics
 - ✚ Forest tree status
 - ✚ Species
 - ✚ Spacing
 - ✚ Silvicultural operations
 - ✓ Forest products valuation approaches
 - ✚ Market approaches
 - ✚ Income approaches
 - ✚ Cost approaches
 - ✓ Valuation of timber forest products
 - ✓ Valuation of non-timber forest products
 - ✓ Elaboration of summary report for forest products value

Resources required for the indicative content

Equipment	Computer, GPS, clinometer, vertex, digital camera, binocular, increment borer
Materials	Paints, warning tape, chalks
Tools	Notebook, pens, pencils, brush, calculator, markers, Forest caliper, tape measure, software for forest data analysis , forest map
Facilitation techniques	<ul style="list-style-type: none"> • Demonstration by viewing videos and films, simulation, Individual and group work, Practical exercise, trainer guided and Group discussion, Oral presentation • Trainer announces the topic of the session to the learners • Trainer show the pictures/videos of different forest products to learners

	<ul style="list-style-type: none"> • Trainer ask the formed learner’s groups to discuss on valuation of forest products • Learners are tasked to Assess forest road current status, Estimate forest road maintenance cost, describe forest inventory and valuate forest products, • Trainer present to the learners forest inventory format and how to fill it • Trainer guide and facilitate the learners while performing their tasks on the class/field • Trainer invites one member from each group to present the group findings to others and he/she gives expert view by explaining more about the task and provides feedbacks to close the session
Formative assessment methods	<ul style="list-style-type: none"> • Written assessment • Oral presentation • Performance assessment • Product based assessment

Integrated assessment

Integrated situation

UMUYOVE company is located in Rubavu District, has gained a forest lease agreement of 49 years with the main purpose of managing Gishwati buffer zone forest. For the past years, the forest did not receive appropriate silvicultural operations. Based on the forest status assessment report, the **UMUYOVE** company planned to improve the forest productivity by applying all required forest management activities. As forest technician you are hired to conduct forest management activities. To do this you are requested to:

1. Assess the forest status on 0.2ha of forest stand
2. Develop a forest management plan on the assessed forest stand
3. Perform required forest management practices on 0.2ha
4. develop report for forest management activities

All required tools, materials and equipment are available in the store

This task should be accomplished within eight (8) hours

Resources

Tools	Forest caliper, tape measure, software for forest data analysis , forest map, videos of forest management activities , internet
Equipment	Computer, GPS, caliper, vertex, relascope, clinometer
Materials	Paints, warning tape, chawks

Assessable outcomes	Assessment criteria (Based on performance criteria)	Indicator	Observation		Marks allocation
			Yes	No	
Learning outcome 1: Plan forest management activities (25%)	1.1. Resources are correctly mobilized based on type of task.	Ind1: Tool, materials and equipment are mobilized			2
		Ind2: Human resources are mobilized			2
		Ind3: Financial means are mobilized			2
	1.2. Forest stand is properly assessed according to forest status.	Ind1: assessment approaches of forest stand are selected			3
		Ind2: Forest stand is assessed			3
	1.3. Forest management plan is properly developed referring to forest owner objectives.	Ind1: Forest management activities are identified			3
		Ind2: forest stand characteristics are described			3
		Ind3: forest stand assessment are conducted			3
		Ind4: Forest management plan is developed			4
Learning outcome 2: Implement forest management plan (50%)	2.1. Tending operations are properly performed according to forest regime and development stage.	Ind1: Forest regimes are described			4
		Ind2: Forest growing stages are described			4
		Ind3: Tending operations are performed			10
	2.2. Forest protection measures are	Ind1: Forest hazards are identified			5

	appropriately applied based on types of hazards.	Ind2: Forest pests and diseases are described			5
		Ind3: Forest protection measures are applied			5
	2.3. Monitoring and evaluation are well conducted based on action plan.	Ind1: Forest monitoring and evaluation tools are identified			4
		Ind2: Forest monitoring and evaluation plan is designed			4
		Ind3: Forest monitoring and evaluation procedures is followed			4
		Ind4: Forest monitoring and evaluation procedures is conducted			5
	Learning outcome 3: Valuate forest products (25%)	3.1. Forest road is properly stabilized in accordance with road embankment guidelines	Ind1: Forest road status is assessed		
Ind2: Forest road maintenance cost is estimated					2
Ind3: Forest road cost summary report is elaborated					2
3.2. Forest inventory is properly conducted based on forest owner objectives, age and composition		Ind1: Forest inventory types are described			3
		Ind2: Forest inventory methods are described			2
		Ind3: Forest inventory plan and timing is designed			2
		Ind4: Forestry resources inventory is conducted			2
3.3. Value of forest products is properly determined based on categories of forest products		Ind1: Factors affecting forest value are defined			2
		Ind2: Forest products valuation approaches are described			2
		Ind3: Forest products are valued			3
		Ind4: Forest products value summary report elaborated			2
Total marks					100
Percentage Weightage					100%

Minimum Passing line % (Aggregate): 70%

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