

The New Senior Secondary Curriculum for Sierra Leone

Subject syllabus for Fishing Industry and the Environment

Subject stream: Social and Cultural Studies



This subject syllabus is based on the National Curriculum Framework for Senior Secondary Education. It was prepared by national curriculum specialists and subject experts.



Curriculum elements for Fishing Industry and the Environment – an everyday subject

Subject Description

The Senior Secondary School (SSS) fisheries and the environment curriculum provides essential concepts about fisheries, its contributions to development, its importance to the well-being of man and its contribution to economic development. This syllabus introduces students both to basic knowledge about the fishing industry as well as some practical skills in fisheries that will open up their understanding about the sector as well as build their curiosity and interest in the industry.

Rationale for the inclusion of Fishing Industry and the Environment in the Senior Secondary School Curriculum

- a) The fishing industry is an important subject in the senior secondary school curriculum in that it enables students to have an understanding of the fishing industry as well as stimulate their interest in entrepreneurship and investment in the fishing industry
- b) To promote knowledge about the environmental impacts of fishing and sustainable fishing practices
- c) It builds students' knowledge-base about the fishing industry in Sierra Leone: regulations, policies and the challenges of the fishing industry in the country
- d) It enables students to develop an appreciation of fisheries resources and how they can be harnessed for a nation's development

General learning outcomes/broad goals

At the end of the course, students will be able to:

- a) Understand basic fisheries concepts
- b) Explain the socio-economic importance of fisheries locally, nationally and internationally
- c) Discuss the various types and methods of fishing
- d) Understand the fish species, fishing methods and regulations of Sierra Leone
- e) demonstrate basic practical skills in fishing such as pond construction and preparation, aquaculture and fish farming, fish feeds and seeds
- f) Explain the environmental impacts of fishing
- g) Apply, appropriate skills and techniques in fishing
- h) Appreciate sustainable fishing practices
- i) Discuss methods for fish processing, preservation, packaging and processing



Subject content outline (Themes and topics to be covered)

A range of themes is suggested for the following components of the syllabus:

1. Introduction and types of fisheries
2. Identification of common fishery organism; fishery habitats
3. Methods, techniques and materials for catching fish (fisheries capture)
4. Fish feeds and feeding
5. Fish farming
6. Introduction to ecosystem approach to fisheries
7. Fish processing, preservation and packaging





Structure of the Syllabus Over the Three Year Senior Secondary School Cycle

	SSS 1	SSS 2	SSS 3
Term 1	<p>Introduction and importance of Fisheries</p> <ul style="list-style-type: none"> • Meaning of fisheries • Fishing as a major source of protein for the world • Global fisheries and aquaculture production • Social and economic benefits of fishing <p>Types of fish</p> <ul style="list-style-type: none"> • Superclass Agnatha (jawless fishes) • Class Chondrichthyes (cartilaginous fishes) • Superclass Osteichthyes (bony fishes) <p>Identification and description of common fishery organisms</p> <ul style="list-style-type: none"> • Fin fishes (e.g. herring, tuna, tilapia) • Crustaceans (shrimp, prawns, lobsters, crabs) • Molluscs (clam, scallops, oyster, cuttle fish, squid) 	<p>Types of fisheries</p> <ul style="list-style-type: none"> • Culture fishes • Catching fish (fishing) • Subsistence fisheries • Artisanal fisheries • Commercial fisheries • Industrial fisheries <p>Fishery habitats</p> <ul style="list-style-type: none"> • Freshwater (river, lake), • brackish water (estuary, • lagoon) and marine. <p>Fish seed production</p> <p>Brood stock selection and handling</p> <ul style="list-style-type: none"> • Difference between male and female sexually matured fishes • Qualities of good breeders • Ways of handling brood stock • Meaning and importance of artificial breeding • Steps involved in artificial breeding of fish 	<p>Common Fish in Sierra Leone</p> <ul style="list-style-type: none"> • Pelagic - The clupeids (<i>Ethmalosa fimbriata</i> (Bonga), <i>Sardinella maderensis</i>, <i>Sardinella aurita</i> (Herrings), <i>Illisha africana lati</i>) and <i>Engraulis encrasicolus</i> (langa mina)) • Demersals - Groupers (<i>Lutjanus</i>), Crocus (<i>Pomadasy</i>), Gwangwa (<i>Pseudotolithus</i>), Snappers (<i>Sparids</i>) and Sole (<i>Cynoglossus</i>) • Crustaceans • Others (mostly molluscs) <p>The fisheries sector in Sierra Leone</p> <ul style="list-style-type: none"> • Industrial fishery • Artisanal fishery • Limitations and challenges
Term 2	<p>Methods and techniques of catching fish</p> <ul style="list-style-type: none"> • Netting • Trawling • Angling • Hook and line • Trap • Electro-fishing • Dredging 	<p>Introduction to the Ecosystem Approach to Fisheries (EAF)</p> <ul style="list-style-type: none"> • Global legal frameworks and instruments leading to the EAF • Definition of EAF • EAF Principles • Reasons for an EAF • Institutional arrangements in support of an EAF 	<p>Fishing policy and regulations</p> <ul style="list-style-type: none"> • Sierra Leone as an international legal actor • International fisheries and environmental treaties • National fisheries law and policy • National legal framework <p>Fish Farming in Sierra Leone</p>



Tools and materials used for catching fish and their uses

- Hooks, cages, knives/cutlasses, traps/basins, cast nets, seine nets, drag nets, lines

Fish feeds and feeding

- Identification of fish feed / food materials (natural fish food and artificial fish food)
- Nutritive value of fish feed ingredients
- Feeding regimes and ideal feeding periods for fish
- Methods of feeding

Concept of aquaculture and fish farming

- Types of aquaculture
- Management systems in aquaculture
- Systems of fish farming
- Advantages of fish farming
- Identification of common qualities of culturable fish species.
- Common culturable fishes

- Comparison with other approaches
- Threats to implementing EAF

Water quality control and monitoring

- Definition of water quality
- Water quality parameters
- Water quality monitoring methods
- Water pollution
- Optimum water parameters range

Climate change and its impacts on fisheries

- Physical changes: surface water temperature rise, Sea level rise, increased water salinity
- Biological changes: change in fish distribution, change of primary production
- Fisheries and food security in Africa: fish productivity and poverty, fish and food supply
- Investment on climate proof fisheries

- Farming systems distribution and characteristics
- Cultured species
- Practices of culture
- Production
- Market and trade
- Contribution to the economy
- Promotion and management



Term 3

Unsustainable fishing practices

- Overfishing, impacts and measures
- Destructive fishing practices impacts and measures
- Illegal, unreported and unregulated fishing (IUU), impacts and measures

Introduction to fisheries management

- Fisheries management and how it works
- Reasons for fisheries management
- Who is responsible for fisheries management?
- Fisheries management measures and tools

Fish culture facilities

- Fishponds – types (earthen ponds, concrete tanks, plastic tanks, fibre glass tanks)
- Components of fishponds (inlets, outlets, dykes/embankments/walls)

Fishpond preparation and management

- Fishpond construction
- Pond preparation (preparation of tools and stocking for pond)
- Pond management
- Pond management practices

Fish processing and preservation

- Equipment used for fish processing and preservation
- Fish products and by products
- Fish packaging materials

Fish processing and packaging in Sierra Leone

- Post-harvest processing and packaging
- Processing of fish from industrial factories
- Fish marketing and wholesaling
- Fish marketing and retailing





Teaching Syllabus Senior Secondary Level 1

Topic/Theme/Unit	Expected learning outcomes	Recommended teaching methods	Suggested resources	Assessment of learning outcomes
Introduction and the importance of fisheries <ul style="list-style-type: none"> • Meaning of 'fisheries' • Fishing as a major source of protein for the world • Global fisheries and aquaculture production • Social and economic benefits of fishing 	By the end of this topic, students will be able to: <ul style="list-style-type: none"> • Define fisheries • Discuss the importance of fisheries 	<ul style="list-style-type: none"> • Start the discussion by defining fisheries for students showing them series of pictures for clearer understanding. • Divide class into small groups for brainstorming session on the importance of fisheries • Let students take turns in their small groups to identify the importance of fisheries. • Then representatives from each group present on what they have learnt about the importance of fisheries • Summarise key points in the lesson for students to note down. 	<ul style="list-style-type: none"> • Short videos on the marine biology at home channel, lesson 9 introduction to fisheries on YouTube • Pupil Handbook • Teacher Lesson-plan Manual 	<ul style="list-style-type: none"> • Class presentation of a poster on fisheries and its importance • Short answer questions (Define fisheries; List the importance of fisheries)
Types of fish <ul style="list-style-type: none"> • Superclass Agnatha (jawless fishes) • Class Chondrichthyes (cartilaginous fishes) • Superclass Osteichthyes (bony fishes) 	Students will be able to: <ul style="list-style-type: none"> • Examine the three main types of fishes and explain and their characteristics 	<ul style="list-style-type: none"> • PowerPoint presentation with pictures on the types of fishes and their characteristics 	<ul style="list-style-type: none"> • Short video on YouTube explaining the types of fishes and their characteristics • Course guidebooks 	<ul style="list-style-type: none"> • Poster presentation on the types of fishes
Identification and description of common fishery organisms	By the end of this topic, students will be able:	<ul style="list-style-type: none"> • Present some pictures of fishery organisms for students to identify to 	<ul style="list-style-type: none"> • Course guidebook • Camera to take photos of common fishery organisms 	<ul style="list-style-type: none"> • Report from field work • Short answer questions on man's contribution



<ul style="list-style-type: none"> • Fin fishes (e.g. herring, tuna, tilapia) • Crustaceans (shrimp/prawns/lobster, crabs) • Molluscs (clam, scallops, oyster, cuttle fish/squid) 	<ul style="list-style-type: none"> • To identify common fishery organisms • List examples of each group of fishery organism 	<p>assess their pre knowledge</p> <ul style="list-style-type: none"> • Explain the main types, giving examples with pictures 	<ul style="list-style-type: none"> • YouTube documentary on common fishery organisms 	<p>to environmental problems</p> <ul style="list-style-type: none"> • Presentation on current global environmental issues in the world
<p>Methods and techniques of catching fish</p> <ul style="list-style-type: none"> • Netting • Trawling • Angling • Hook and line • Trap • Electro-fishing • Dredging 	<p>By the end of this topic, students will have an understanding of:</p> <ul style="list-style-type: none"> • The various methods of catching fish and their advantages and disadvantages 	<ul style="list-style-type: none"> • Question and answer session to take students from known to the unknown, e.g., What are methods of catching fish? List five methods and briefly explain each. List the advantages and disadvantages of each method. • Field work at a fishing site 	<ul style="list-style-type: none"> • Course Guidebook • YouTube video 	<ul style="list-style-type: none"> • Presentation on common fishing methods in Sierra Leone
<p>Tools and materials used for catching fish and their uses</p> <ul style="list-style-type: none"> • Hooks, cages, knives/cutlasses, traps/basins, cast nets, seine nets, drag nets, lines 	<p>By the end of this topic, students will be able to:</p> <ul style="list-style-type: none"> • Identify fishery tools and materials • Explain the uses and functions of common tools used for catching fish 	<ul style="list-style-type: none"> • Navigate from known to unknown, e.g., Do you know of any equipment used for fishing? • If yes list some of the equipment you know. Briefly explain how they are used. • Explanation of fishing equipment using pictures for clear understanding 	<ul style="list-style-type: none"> • YouTube video showing fishery tools and equipment • Course guidebook • Field visit to a common fishing ground 	<ul style="list-style-type: none"> • Short answer questions: e.g., What is a hook and line and how is it used? What is the difference between a cast net and a seine net?
<p>Fish feeds and feeding</p> <ul style="list-style-type: none"> • Identification of fish feed / food materials (natural fish food and artificial fish food) • Nutritive value of fish feed ingredients 	<ul style="list-style-type: none"> • By the end of this topic, students will be able to: • Identify natural and artificial fish feed. 	<p>Test pre-knowledge of students by asking questions such as:</p> <ul style="list-style-type: none"> • What is a fish feed? • What is natural fish feed? Give examples. 	<ul style="list-style-type: none"> • Course guidebook • YouTube videos of fish feeds, and how to make fish feeds 	<ul style="list-style-type: none"> • Class project to make fish feeds from simple items





<ul style="list-style-type: none"> • Feeding regimes and ideal feeding periods for fish • Methods of feeding 	<ul style="list-style-type: none"> • Discuss the nutritive value of fish feeding ingredients • Explain the Ideal feeding periods for fish 	<ul style="list-style-type: none"> • What is an artificial fish feed? Give examples. • What are the methods of feeding fish? • Poster showing fish feeds and feeding methods 		
<p>The concept of aquaculture and fish farming</p> <ul style="list-style-type: none"> • Types of aquaculture • Management systems in aquaculture • Systems of fish farming • Advantages of fish farming • Identification of common qualities of culturable fish species. • Common culturable fishes 	<p>By the end of this topic, students will be able to:</p> <ul style="list-style-type: none"> • Define aquaculture • List the types of aquacultures • Discuss management systems in aquaculture • Discuss fish farming systems and advantages 	<ul style="list-style-type: none"> • Show a short video on aquaculture and fish farming (YouTube) • Small group discussions and a summarised presentation by pupils of what they have learnt from the video. • After introducing information, pose questions for pupils to discuss and answer, e.g., What is aquaculture? List the types of aquaculture. What is fish farming? What are the advantages of fish farming? What is fish culture? List five qualities of common culturable fishes. • Chalk and talk by first drawing illustrations on the board, followed by detailed explanation • Field visit to a nearby fish farm or use of the school's fishpond, if available 	<ul style="list-style-type: none"> • YouTube videos on aquaculture, fish farming and culturable fishes • Course book • Posters • Flash cards showing common culturable fishes 	<ul style="list-style-type: none"> • Report and presentation of field visit • Short answer questions
<p>Unsustainable fishing practices</p>	<ul style="list-style-type: none"> • By the end of this topic, students will be able to: 	<ul style="list-style-type: none"> • Presentation of TEDx and TED Ed videos on 	<ul style="list-style-type: none"> • YouTube videos on overfishing, destructive and illegal fishing 	<ul style="list-style-type: none"> • Presentation of a poster on degraded fishery environments



<ul style="list-style-type: none"> • Overfishing, its impacts, and measures against it • Destructive fishing practices, their impacts, and measures against them • Illegal, unreported and unregulated fishing (IUU), its impacts and measures against it 	<ul style="list-style-type: none"> • Define overfishing • Explain the impacts of overfishing and some of the measures that can be taken to minimise it • Define destructive fishing • Discuss the measures and impacts of destructive fishing • Discuss illegal, unreported and unregulated fishing, its impacts and measures against it • Undertake a field visit to a fishing community administering a questionnaire investigating unsustainable fishing practice, their impacts, and measures against them 	<p>unsustainable fishing from YouTube</p> <ul style="list-style-type: none"> • Ask students questions to know what they have learnt (e.g., what is overfishing? List technologies used for overfishing. What are the impacts of overfishing?) • Use posters to explain overfishing, destructive fishing and illegal and unreported and unregulated fishing, their impacts and measures against them. 	<ul style="list-style-type: none"> • Coursebook 	
<p>Introduction to fisheries management</p> <ul style="list-style-type: none"> • Fisheries management and how it works • Reasons for fisheries management • Who is responsible for fisheries management? • Fisheries management measures and tools 	<p>By the end of this topic, students will be able to:</p> <ul style="list-style-type: none"> • Explain fisheries management and how it works • Discuss reasons why fisheries management is important • Identify key stakeholders in fisheries management 	<p>YouTube video on fisheries management</p> <ul style="list-style-type: none"> • Group discussion on waves, tides and ocean currents, on river flows and on water management in ponds and lakes • Chalk and talk to enhance proper understanding of the topic 	<ul style="list-style-type: none"> • Coursebook • YouTube video on fisheries management • Poster • Resources on the Food and Agricultural Organisation (FAO)'s website https://www.fao.org/fishery-aquaculture/en/ 	<p>Group presentation on fisheries management and tools</p> <p>Short answer questions on fisheries management</p> <p>Assignment to investigate existing fisheries management in Sierra Leone</p>





Senior Secondary Level 2

Topic/Theme/Unit	Expected learning outcomes	Recommended teaching methods	Suggested resources	Assessment of learning outcomes
Types of fisheries <ul style="list-style-type: none"> • Catching fish (fishing) • Subsistence fisheries • Artisanal fisheries • Commercial fisheries • Industrial fisheries 	By the end of the topic, students will be able to: <ul style="list-style-type: none"> • Identify and discuss the various types of fisheries 	<ul style="list-style-type: none"> • PowerPoint presentation showing the types of fisheries • Audio-visual materials to give exposure to a range of examples and contexts and to aid better understanding 	<ul style="list-style-type: none"> • Course guidebook • YouTube videos on types of fisheries 	<ul style="list-style-type: none"> • Poster presentations by pupils on the types of fisheries
Fishery habitats <ul style="list-style-type: none"> • Freshwater (rivers, lakes, ponds), • Brackish water (somewhat salty - estuaries, lagoons, salt marshes) • Marine (salt water – the sea) • Coral reefs and marine protected areas 	<ul style="list-style-type: none"> • By the end of this topic, students will be able to: • Identify and discuss the various types of fishery habitats • Define coral reefs and marine protected areas and their importance 	<ul style="list-style-type: none"> • Field trips to fresh water, brackish and marine habitats. • Engage a local guide or fisheries worker on each visit, if available, as a resource person to explain and to answer pupils' questions. • Pupils observe these habitats and discuss their management. • Pupils take notes about the characteristics of each habitat and the common fishery organisms common there. 	<ul style="list-style-type: none"> • Course guidebook • YouTube videos on fishery habitats and marine protected areas • National Geographic Coral reefs 101 video http://nationalvideographic.com/coral-reefs-101-national-geographic/ 	<ul style="list-style-type: none"> • Presentations, posters and reports by pupils of findings from the field work





<p>Fish seed production</p> <ul style="list-style-type: none"> • Brood stock selection and handling • Differences between male and female sexually matured fishes • Qualities of good breeders • Ways of handling brood stock • The meaning and importance of artificial breeding • Steps involved in artificial breeding of fishes 	<ul style="list-style-type: none"> • At the end of this topic, student will be able to: • Discuss on broodstock / fishbrood and how they are selected and handled for fish farming. • Explain the differences between male and female sexually matured fishes • Explain the qualities of good breeders • Artificial breeding and its importance • Steps involved in artificial breeding of fishes 	<ul style="list-style-type: none"> • Show Youtube video on broodstock selection and handling from the masters' vessel classic channel https://www.youtube.com/watch?v=EG0tGXy2Hs0 • Class discussion based on the video. • What is broodfish / broodstock? • List the requirements for selecting broodfish • What are the differences between male and female fish? • List some qualities of good breeders • Field trip to a nearby fish farm • If possible, get a male catfish, bisect it and remove the milt sac and present in class 	<ul style="list-style-type: none"> • You Tube video • Course guidebook • Camera to take pictures of broodstock 	<ul style="list-style-type: none"> • Group presentation of fieldwork
<p>Introduction to the ecosystem approach to fisheries (EAF)</p> <ul style="list-style-type: none"> • Definition of EAF • Global legal frameworks and instruments leading to the EAF • EAF Principles • Reasons for an EAF 	<p>By the end of this topic, students will be able to:</p> <ul style="list-style-type: none"> • Define EAF • Explain the legal framework and instruments leading to the EAF • List some of the principles of EAF 	<ul style="list-style-type: none"> • Question and answer session: What is an ecosystem? • Ecosystems in the context of fisheries • Explain using PowerPoint 	<ul style="list-style-type: none"> • Course guidebook • YouTube video on EAF • Resources on FAO's website • The Ecosystem Approach to Fisheries Management website http://eafmlearn.org/ 	<ul style="list-style-type: none"> • Assignment to discuss the history and objectives of the EAF



<ul style="list-style-type: none"> • Institutional arrangements in support of an EAF • Comparison with other approaches • Threats to implementing EAF 	<ul style="list-style-type: none"> • Explain the reasons for an EAF • Compare the EAF with other approaches • Discuss the threats in implementing the EAF 	<p>presentations of an EAF in detail</p> <ul style="list-style-type: none"> • Show examples using audio- visuals for better understanding 		
<p>Water quality control and monitoring</p> <ul style="list-style-type: none"> • Definition of water quality • Water quality parameters • Water quality monitoring methods • Water pollution • Optimum water parameters range 	<ul style="list-style-type: none"> • By the end of this topic, students will be able to: • Define water quality • Explain terms such as Dissolved Oxygen (DO), acidity (pH), temperature, turbidity • Understand water quality parameters • Examine water quality monitoring methods • Discuss the causes, prevention and control of water pollution 	<ul style="list-style-type: none"> • Show videos on water quality, water quality parameters and pollution, on YouTube • Small group discussion among learners, and presentation • Fieldwork by collecting water samples from a nearby water source (river, lake, stream, sea, pond or other) 	<ul style="list-style-type: none"> • Course guidebook • YouTube video of water quality • Water quality testing instruments 	<ul style="list-style-type: none"> • Presentation from field work and google earth exercise Practical session for testing water quality
<p>Climate change and its impacts on fisheries</p> <ul style="list-style-type: none"> • Physical changes: surface water temperature rise, Sea level rise, increased water salinity • Biological changes: change in fish distribution, change of primary production • Fisheries and food security in Africa: fish productivity and poverty, fish and food supply • Investment in climate-proof or climate-resilient fisheries 	<ul style="list-style-type: none"> • By the end of this topic, students will be able to: • Explain the physical and biological changes related to climate change • Fisheries and food security in Africa • Investment in climate-proof or climate-resilient fisheries 	<ul style="list-style-type: none"> • Navigate from the known to unknown by asking questions such as: What is climate change? What are the causes of climate change? What are the effects of climate change? • Then explain about impacts specifically on fisheries • Show FAO's video of climate change effects on fisheries on YouTube https://www.youtube 	<ul style="list-style-type: none"> • YouTube videos on climate change and its effects on fisheries • Marine Stewardship Council (MSC) site on climate change and fisheries Climate change and fishing Marine Stewardship Council (msc.org) 	<ul style="list-style-type: none"> • Short answer questions on climate change impacts on fisheries, food security and climate change in Africa





		<p>.com/watch?v=ACsKKJlhNmNo</p> <ul style="list-style-type: none"> • Discussions based on the video • Explain vulnerability of sub-Saharan Africa to the impacts of climate change 		
<p>Fish culture facilities</p> <ul style="list-style-type: none"> • Fishpond types: earthen ponds, concrete tanks, plastic tanks, fiberglass tanks • Components of fishponds (inlets, outlets, dykes, embankments, walls) 	<ul style="list-style-type: none"> • By the end of this topic, students will be able to: • Define fishpond and their main types as well as their characteristics • Describe the components of fish tanks 	<ul style="list-style-type: none"> • Brainstorming session: What is a fishpond? • List and describe the types of fishponds • YouTube video showing various types of fishponds their advantages and disadvantages • Field visit of a fishpond if not available at school 	<ul style="list-style-type: none"> • YouTube video on fishpond facilities and their use https://www.youtube.com/watch?v=ACsKKJlhNmNo • FAO's website • Video of a fish farm initiative in Sierra Leone https://www.youtube.com/watch?v=opxJYWq7_Qw • A fishpond 	<ul style="list-style-type: none"> • Short answer questions • Compare between concrete tanks and earthen ponds
<p>Fishpond preparation and management</p> <ul style="list-style-type: none"> • Fishpond construction • Pond preparation (preparation of tools and stocking for pond) • Pond management practices 	<p>By the end of this topic, students will be able to:</p> <ul style="list-style-type: none"> • Describe the procedures of constructing a fishpond • Understand pond preparation in terms of tools and stocking of the pond • Explain methods in managing ponds 	<ul style="list-style-type: none"> • YouTube video showing the construction, preparation and management of a fishpond • Field visit to witness the construction and or preparation of fishponds 	<ul style="list-style-type: none"> • YouTube videos on fishpond construction and preparation • FAO's website 	<ul style="list-style-type: none"> • Report from field visit





Senior Secondary Level 3

Topic/Theme/Unit	Expected learning outcomes	Recommended teaching methods	Suggested resources	Assessment of learning outcomes
Common Fish in Sierra Leone <ul style="list-style-type: none"> • Pelagic- The clupeids (<i>Ethmalosa fimbriata</i> (Bonga), <i>Sardinella maderensis</i>, <i>Sardinella aurita</i> (Herrings), <i>Illisha africana</i> (lati) and <i>Engraulis encrasicolus</i> (langa mina)) • Demersals- Groupers (<i>Lutjanus</i>), crocus (<i>Pomadasy</i>), Gwangwa (<i>Pseudotolithus</i>), Snappers (<i>Sparids</i>) and Sole (<i>Cynoglossus</i>) • Crustaceans • Others (mostly molluscs) 	By the end of this topic, students will be able to: <ul style="list-style-type: none"> • Identify the common fish species in Sierra Leone 	<ul style="list-style-type: none"> • Field trip to a fishery site, beach or market (e.g., Goderich, Tombo, Bondapi, Gbanbatoke) where students can see some common fishery organisms 	<ul style="list-style-type: none"> • Flash cards showing common fish species in Sierra Leone • YouTube videos • Camera (phone) 	<ul style="list-style-type: none"> • Quiz • Report presentation from field trip
The fisheries sector in Sierra Leone <ul style="list-style-type: none"> • Industrial fishery • Artisanal fishery • Limitations and challenges 	By the end of this topic, students will be able to: <ul style="list-style-type: none"> • Explain how artisanal fishery operates in Sierra Leone 			
<ul style="list-style-type: none"> • Fishing policy and regulations • Sierra Leone as an international legal actor • International fisheries and environmental treaties • National fisheries law and policy 	<ul style="list-style-type: none"> • By the end of this topic, students will be able to: • List and name key purposes of international fisheries and environmental treaties • Summarise the main points of fisheries laws 	<ul style="list-style-type: none"> • Summarise the fisheries policies and laws in Sierra Leone 	<ul style="list-style-type: none"> • Summary descriptions of fisheries legal and policy documents of Sierra Leone and international treaties 	<ul style="list-style-type: none"> • Question and answer. • Pupil essays



<ul style="list-style-type: none"> • National legal framework 	<p>and policy in Sierra Leone</p>			
<p>Fish Farming in Sierra Leone</p> <ul style="list-style-type: none"> • Farming systems • Distribution and characteristics • Cultured species • Practices of culture • Production • Market and trade • Contribution to the economy • Promotion and management 	<p>By the end of this topic, students will be able to:</p> <ul style="list-style-type: none"> • Answer questions accurately about the status of fish farming in Sierra Leone • Identify the cultured fishery species in Sierra Leone • Explain the production, market, trade and contribution of fish farming to the economy of Sierra Leone 	<ul style="list-style-type: none"> • Discussion, question and answer session: e.g., what is fish farming? How would you rate fish farming in Sierra Leone? • What culturable fishery species are common in Sierra Leone? • How does fish farming contribute to the economy? • PowerPoint presentation where students will be through the fish farming sector in the country citing examples of fish farms that are thriving in the country. • If possible, field visit to a successful fish farm in Sierra Leone 	<ul style="list-style-type: none"> • YouTube videos on fish farms in Sierra Leone and other countries (for comparison) 	<ul style="list-style-type: none"> • Report presentation from field visit
<p>Fish processing and preservation</p> <ul style="list-style-type: none"> • Equipment used for fish processing and preservation • Fish products and by products • Fish packaging materials 	<p>By the end of this topic, students will be able to:</p> <ul style="list-style-type: none"> • Describe the basic processes of processing and preserving fish • Identify fish products and by products • Explain fish packaging 	<ul style="list-style-type: none"> • Discussion from observations from field visit • Explanation of equipment used for preserving fish, fish products and by products, packaging materials 	<ul style="list-style-type: none"> • YouTube videos on fish processing and preservation 	<ul style="list-style-type: none"> • Presentation of poster on fish processing and preservation techniques
<p>Fish processing and packaging in Sierra Leone</p>	<p>By the end of this topic, students will be able to:</p>	<ul style="list-style-type: none"> • Field visit to a fish processing site (e.g., Tombo fishery) 	<ul style="list-style-type: none"> • YouTube video on fish processing and 	<ul style="list-style-type: none"> • Presentation of report from field visit





<ul style="list-style-type: none">• Post-harvest processing and packaging• Processing of fish from industrial factories• Fish marketing and wholesaling• Fish marketing and retailing	<ul style="list-style-type: none">• Describe the basic processes of processing and packaging fish used in Sierra Leone	company), where students will be taken through the methods of processing and packaging fish	packaging in Sierra Leone	
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