Subject: Science

Level: Standard 3

Strand: Systems and Interaction

Topic: Effect of human activities on aquatic environments

Key Points:

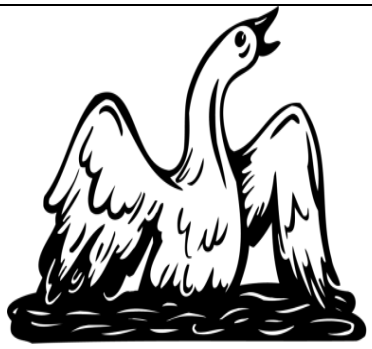
- An aquatic environment is an area with water based conditions.
- Examples of aquatic environments are rivers, ponds, swamps, seas, oceans, coral reefs
- Some major local examples on aquatic environments are the Caroni Swamp, Nariva Swamp, Buccoo Reef / Bon Accord Lagoon Complex
- Some human activities which have major effects on these aquatic environments are
    - Pollution:
        - Solid waste eg. discarded plastic products, tires, car parts, mattresses and other furniture.
        - Liquid waste eg. oil spills, sewage, chemical waste from factories,fertilisers and pesticides in run off (from agricultural land).
        - Dissolved gasses from open fires, factory smoke stacks (chimney), vehicular exhaust
    - Over-exploitation of resources:
        - Over fishing or removal of animals before they can reproduce off springs.
        - Destruction of nesting sites.
        - Excessive removal of resources: plants, trees, so much so that there is not sufficient time for them to be replenished.
    - Introduction of non-native species.
        - A type of plant or animal which was never found in an area
        - This type of plant or animal was later introduced by human activity.
        - They usually compete with local species for space or food.
        - Usually they have few natural predators, so they spread rapidly

- Examples are the Asian Green Mussel (from Asia in 1990), The Lionfish (from the Indo-Pacific in 2012) and the Water Hyacinth which was originally identified in Brazil in 1823 but reached Trinidad around 1976.

Activity

1. Effects of pollution on aquatic environments.

Below is a storyboard. Examine the pictures in each row.Write a short description on the the effect of the type of pollution. .

Storyboard on Pollution		**Type of pollution and the effects**
		(i) Oil spill:
		(ii) Garbage:
		(iii) Fertilizer or sewage:

2. Overfishing

(i) Gerry loves crab and dumpling. His sister looks forward to Grandma's dish of curry Cascadura (cascadoux). The prices of the crab and Cascadura have been increasing as vendors complain that there is less available in the swamps.





Explain how over fishing or over exploitation could be the cause of this.

_____

_____

(ii) Jerry's Mom said that kingfish, salmon, flying fish and shrimp are now listed as over exploited in Trinidad and Tobago so there is less of these fish in the ocean.



These fish are food for larger fish such as tuna and shark. How would the number of tuna and shark be affected?

_____

3. Introduction of a non- native species



The Asian Green Mussel first arrived in Trinidad in 1990 from Asia. It was transported to this region by being attached to ships.

The Asian Green Mussel feeds on tiny sea plants. They grow rapidly and compete with shrimps for food. Their shell is thick. This makes it difficult for predators such as crabs to eat them.

(i).Draw a food chain for the Asian Green Mussel



(ii). How does the introduction of the Asian Green Mussel affect the amount of sea plants and shrimps?

_____

_____

(iii).Which human activity was responsible for the arrival of this non- native species?

_____

Assessment

4. (i) List 3 main ways aquatic environments can be affected by human activities.

_____

_____

_____

(ii). Give two examples of the main human activities listed above, which are most likely the cause of the changes in the coral reef shown below?



Example of cause due to main human activity #1: _____

Example of cause due to main human activity #2: _____

Answer Key

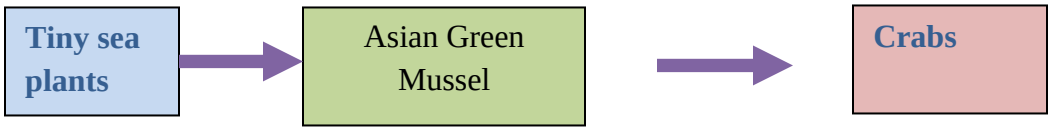
1.

(i) Oil spill: **Oil pollutes the water and also covers fish and water birds. These animals get difficultyto move and may die.**
(ii) Garbage: **Plastics, fishing nets etc litter the water. Fishes may swallow the garbage and die. Otheranimals such as turtles may become entangled in nets and eventually die.**
(iii) Fertilizer or sewage: **Chemicals such as fertilizers are washed into the drains and rivers. Sewage is sometimes pumped into waterways. This water eventually reaches the sea and destroys corals.**

2 (i) **Over fishing or over exploitation would lead to too many crabs and cascadura being removed from the swamp. As this continues, there are fewer of these animals to reproduce, so their numbers decrease.**

(ii)**There would be less food for the tuna and sharks, so there numbers will eventually decrease.**

3.(i).Draw a food chain for the Asian Green Mussel



(ii). The introduction of the Asian Green Mussel can affect the balance of organisms, as follows:

- **They will compete with shrimp for food, so the number of shrimp may decrease.**
- **Since the crabs have difficulty eating the Asian GreenMussel, more survive and reproduce, so their numbers will increase.**

(iii). **Thehuman activity which was responsible for the arrival of this non- native species is shipping**

4. (i) Three main ways aquatic environments can be affected by human activities are:.

- **Pollution**
- **Over-exploitation of resources**
- **Introduction of non-native species**

(ii).Examples of causes due to main human activity:

#1: **Run-off which has liquid waste such as fertilizers or sewage (pollution).**

#2: **Over-exploitation of resources by tourists.**

Acknowledgement

Activity with Picture	**Reference**
1 (i) Oil spill (Oil spill in water)	https://visual.ly/tag/save-oceans Copied from Google Images Save Our Oceans | Visual.ly
1 (i) Oil spill (Bird in oil spill)	https://www.graphicsfactory.com/Clip-Art/Nature/oil-spill-bird-059-386127.html bird stuck in oil spill clipart. Royalty-free GIF, JPG, PNG, EPS ... graphicsfactory.com
1. (ii) Garbage (Plastic in water)	https://minutes.co/the-plastic-pollution-problem-how-society-can-shift-to-be-plastic-free/ The Plastic Pollution Problem: How Society Can Shift To Be Plastic ... minutes.co
1. (ii) Garbage (Turtle in water)	https://www.independent.co.uk/life-style/plastic-bad-environment-why-ocean-pollution-how-much-single-use-facts-recycling-a8309311.html Copied from Google Images Why is plastic bad for the environment ... independent.co.uk
1. (iii) Fertilizer or sewage (Runoff)	https://www.nationalgeographic.org/encyclopedia/point-source-and-nonpoint-sources-pollution/ Copied from Google Images Point Source and Nonpoint Sources of ... nationalgeographic.org
1. (iii) Fertilizer or sewage (Coral death)	https://www.youtube.com/watch?v=7-DQNTKOO1M What Happens If All The Coral Dies? LifeNoggin Copied from Google Images What Happens If All The Coral Dies ... youtube.com
2 (i). Crab and Dumpling	https://en.tripadvisor.com.hk/LocationPhotoDirectLink-g12324053-d10781020-i244712373-Simply_Gourmet-Saint_James_Port_of_Spain_Trinidad_Trinidad_and_Tobago.html Copied from Google Images Curry Crab & Dumpling - Picture of Simply Gourmet, Saint James en.tripadvisor.com.hk

2 (i). Cascadura	https://www.pinterest.com/pin/294845106837300433/ Copied from Google Images Curried Cascadura and peas | Home food ... pinterest.com
2 (ii). Fish stall	https://www.freeimages.com/premium/fresh-fish-stall-1797482 Fresh Fish Stall Stock Photos ... freeimages.com
3. The Asian Green Mussel	https://en.wikipedia.org/wiki/Perna_viridis Pernaviridis - Wikipedia en.wikipedia.org
4 (ii). Coral reef	http://www.greenhumour.com/2012/07/the-coral-calamity.html Green Humour: The Coral Calamity greenhumour.com