

Lesson Plans: Sea Water and Agriculture

Objective

The objectives of this activity are to help students to understand that even a small rise in sea level can lead to salinization of valuable agricultural land and to encourage students to start thinking of possible solutions to the problem.

Materials

- 2 potted plants (same type of plant)
- Container of fresh water
- Container of sea water

Important Points to Understand

The teacher will explain that the class is about to examine how a rise in sea level can affect agriculture. First, a small experiment will be conducted to discover the effect of salt water (sea water) on a growing plant. The experiment will be started during the lesson, but its results cannot be observed for several days.

Procedure

1. Teacher introduces the lesson, then explains the experiment. Two similar potted plants are to be placed side by side. One will be watered each day using fresh water, and the other will be watered with salt water. As each day passes, the students can note differences between the plants. They can observe how long it takes before the second plant is killed by the salt water.
2. After leaving this experiment to take its course, the teacher can then discuss sea level rise in the Pacific and how agriculture might be affected. Reference can be made to the cross-section of an atoll, and the way sea level rise will cause the water in the bottom of the taro (babai) pits to become more salty.
3. The class can be divided up into small groups of 4 or 5. Each group will be asked to discuss possible solutions to the problem of rising sea levels and the salinization of coastal land.
4. At the end of 20 minutes or so, all groups can come together and report their findings to the class. The teacher can summarize the ideas on the board. It is important to be uncritical and accept all possible answers, ranging from the local to international. If students are short of ideas, the teacher can feed them some of these suggestions:
 - Instead of cultivating coastal lowlands, move agricultural activities to the lower slopes of the higher ground behind the coast (However, there will be a need to be very careful about soil erosion and take appropriate measures).
 - Develop better water management for vegetation.
 - Re-afforest of the land immediately adjacent to the beach. This will reduce erosion by the sea, and reduce evaporation from ground under the trees, helping to conserve fresh water.
 - Build sea walls that will protect against storm surges and, at the same time, absorb the energy of the waves. For example, walls built of large stones are much more effective than solid concrete walls (which tend to reflect the waves and make them remove even larger quantities of beach material).
 - Encouraging the national leaders of your country to press for more international co-operation in dealing with the basic causes of sea level rise, especially the reduction of fossil-fuel burning, and deforestation
 - Encouraging people to work for the basic unity of the human race, for only when people are truly united can they really work together to stop global environmental degradation. All the money that is presently being spent on weapons of war can be used instead to develop better technology, new sources of energy, new agricultural techniques, etc.

Follow-Up Work

1. Students can draw -a series of 'comic-strip' pictures that will show what might happen to agriculture in coastal areas if sea level rises by 1 meter. This can be done individually or as a group activity.
2. Each student can be asked to write an essay entitled: "How can Pacific islanders help solve the problem of rising sea levels and agricultural system difficulties that may arise?"