

# Deforestation in Haiti

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**Lesson Overview:** Students examine causes, effects, and solutions to deforestation in Haiti.

**Objectives:** The student will be able to:

- Describe the geography and environment of Haiti.
- Explain the causes of deforestation in Haiti.
- Explain the effects of deforestation on the environment and people of Haiti.
- Propose and evaluate solutions to deforestation in Haiti.

**Subject/Grade Level:** Social Studies, Geography, 6-12

**Student Materials:**

- Student Reading about Haiti;
- Cause/effect statement cards;
- Blank cause/effect graphic organizer;
- Student Assessment Packet:
  - Assignment
  - magazine articles “Manure, Paper Waste and Corn Stalks Help Halt Deforestation in Haiti” and “Massive Savings bring opportunities for destitute families:” ;
- Laminated map of Middle America/World (textbook map will also work),

**Teacher Materials:**

- Teacher Notes
- Answer keys

**Deforestation of Haiti PPT**

## **Michigan Grade Level Content Expectations**

- **6-G1.2.6** Apply the skills of geography inquiry to analyze a problem or issue of importance to a region of the Western Hemisphere
- **6-G1.3.1** Use the fundamental themes of geography to describe regions or places on earth
- **6-G5.1.1** Describe the environmental effects of human action on the atmosphere, biosphere, lithosphere, and hydrosphere
- **6-G5.1.3** Identify the ways in which human-induced changes in the physical environment in one place can cause changes in other places
- **6-G5.2.1** Describe the effects that a change in the physical environment could have on human activities and the choices people would have to make in adjusting to the change
- **6-G6.1.1** Conduct research on contemporary global topics and issues, compose persuasive essays, and develop a plan for action
- **WHG CG2 Resources** Explain the changes over the past 50 years in the use, distribution, and importance of natural resources on human life, settlement, and interactions

## **National Geography Standards:**

- **STANDARD 4:** The physical and human characteristics of places.
- **STANDARD 14:** How human actions modify the physical environment.
- **STANDARD 15:** How physical systems affect human systems.
- **STANDARD 16:** The changes that occur in the meaning, use, distribution, and importance of resources.

## **ELA Common Core: Speaking and Listening Comprehension and Collaboration**

**1.** Initiate and engage actively in group discussions on *grade 6-7 topics, texts, and issues* being studied in class.

**Procedure:**

- 1. Anticipatory set:** locate/describe/compare Haiti with other countries and regions based on its location by looking at the laminated maps and NGS map of West Indies. Some questions to ask relating to the Five Themes of Geography: **(Slide 4)**
  - Where is it? (absolute and relative *Location*) **(Slides 5-6)**
  - In what *Region* is this? (describe cultural, geographic) **(Slide 7)**
  - Describe its expected climate and vegetation based on another place of similar latitude (Hawaii works well) **(Place)**. **(Slide 8)**
  - Students draw a picture of what they expect the vegetation of Haiti to look like. **(Slide 9)** Give students about 3 minutes to draw their pictures and then ask them if their picture looks like **Slide 10**.
  - Remainder of the lesson will focus on *Movement* and *Human-Environment Interaction*
- 2. Introduction: (Slides 11-12).** This shows the border between Haiti and the Dominican Republic. At one time Haiti was completely covered with trees and other vegetation. In reality, much of Haiti is more like this picture. Explain to students that scientists estimate that about 40% of the original tropical forests in the world have been lost. On the island of Haiti, they have disappeared completely. In 1900 60% of Haiti was forested and only 1.5% of that forest remains today. Haitians cut over 30 million trees a year.

Use the Columbus quote with students. It was written by **Christopher Columbus** to Ferdinand and Isabella, describing the island of Haiti: **(Slide 13/ Student Reading)**

- a. Discuss this quote with students. What could have led to the near-complete loss of rainforests on Haiti? How does this affect the people who live there now? Are the same animals found on Haiti now as were in the days of Columbus?
  - b. Another description was written in 1904: **(Slide 14/Student Reading)**
- 3. Guided Practice:** Give each student a **Cause/effect organizer (Slide 15)** and one **Card** containing a cause, effect, statistic, or solution. (Some may get more than one) Each student will need to determine into which category his/her slip fits and then volunteer that in the class discussion.

Ask students to provide the causes from their slips and then discuss these (use **teacher notes** for additional explanations) while filling in the graphic organizer. Continue with effects, statistics. For effects of erosion show **Slide 17** and the cartoon on fishing when appropriate **(Slide 18)**. *(See answer key for statistic placement)*

- 4. Group Work - solutions:** After determining causes and effects of deforestation **(Slide 19)** use their slips and other ideas to discuss solutions to deforestation **(Slide 20)**. **Slide 21** is part of the solution with mangos and **Slide 22** shows solar ovens (see teacher notes).

Discuss why we should care about the rainforests in Haiti or anywhere else (discussion can focus on the value of the rainforest as well as the moral issues regarding concern for the environment and other people) **(Slide 22)**

### Assessment: (Slides 24-26)

- **Student Assessment Packet:** Students will read news articles “Manure, Paper Waste and Corn Stalks Help Halt Deforestation in Haiti” and “Massive Savings bring opportunities for destitute families:” and write a political campaign speech with the issue of deforestation as their platform.
- Other possible assessments include:
  - creating a power point on causes, effects, and solutions to deforestation, class discussion on costs vs. benefits,
  - reading and responding to editorials and letters to the editor,
  - evaluating graphs from [www.mongabay.com](http://www.mongabay.com)
  - Watching NY Times video <http://www.youtube.com/watch?v=kLmpFHSsGD0> and develop a response to the disaster exacerbated by environmental destruction

### Extensions:

- Discuss some or all of these news reports/videos on deforestation in Haiti
  - <http://www.youtube.com/watch?v=2dtiZ6lec6Y>
  - [http://www.youtube.com/watch?v=4FBZ\\_WhdQdw](http://www.youtube.com/watch?v=4FBZ_WhdQdw) Bill Clinton on waste paper bricks in Haiti
  - <http://www.youtube.com/watch?v=D9EhdzdAeqU> reforestation in Haiti
  - Investigate China’s role in deforestation and illegal logging:
  - Best site: (statistics, links, solutions)  
<http://factsanddetails.com/china.php?itemid=389&catid=10&subcatid=66>
  - Impact on current floods/mudslides  
<http://www.abc.net.au/news/stories/2010/08/11/2980462.htm?section=world>
  - China and Africa resources:
  - [http://www.google.com/hostednews/afp/article/ALeqM5jidq80TTe\\_Lq5C8H00KUjCPoLTgA](http://www.google.com/hostednews/afp/article/ALeqM5jidq80TTe_Lq5C8H00KUjCPoLTgA)  
<http://www.globaltimber.org.uk/deforestation&oil.htm>
  - Illegal imports/exports around the world (including S. America)  
<http://www.globaltimber.org.uk/ChinaIllegalImpExp.htm>  
<http://www.eia-international.org/files/reports93-1.pdf>  
<http://e360.yale.edu/images/digest/BGA-Indonesia-report.pdf>  
<http://www.globaltimber.org.uk/G8IllegalTimber.htm>
  - videos:  
Jamie Durie (HGTV) video  
<http://www.youtube.com/watch?v=sVdEZUrGVeg>
  - deforestation and reforestation  
[http://www.youtube.com/watch?v=xJLfAafwY\\_g](http://www.youtube.com/watch?v=xJLfAafwY_g)  
[http://www.dailymotion.com/video/x310ag\\_chinas-forests\\_news](http://www.dailymotion.com/video/x310ag_chinas-forests_news)
- Additional extensions:
  - Use the cause/effect procedure with many other issues. Have students place their slips under the appropriate column on poster or board and then discuss in groups if any should be moved.
  - Use pictures to have students analyze and compare place characteristics of different regions.

- Have students find another place in the world that is experiencing the devastating effects of deforestation such as found in Haiti and compare and contrast cause/effect etc.
- Have students put their slips of paper on the walls around the room under appropriate categories (cause, effect, solution) and allow time to move slips to other categories
- Build a solar oven ([www.sunoven.com/haiti.asp](http://www.sunoven.com/haiti.asp))
- Design a class project to raise money to send solar ovens to Haiti
- Design a product not based on wood that could provide tourist income for Haiti
- Create a web map with a tree at the center to organize notes
- Use the Internet to collect headlines on news in Haiti. Analyze how these issues contribute to deforestation.

## References

- [www.cnn.com/world](http://www.cnn.com/world) (statistical info on Haiti and government) accessed 6-27-03
- <http://dolphin.uenn.edu/~dhas/history.html> (Haiti's history) accessed 6-27-03
- [www.oreworld.org/mango.htm](http://www.oreworld.org/mango.htm) (mango industry in Haiti) accessed 7-6-13
- [www.lexis-nexis.com/stat.univ](http://www.lexis-nexis.com/stat.univ) (statistics) accessed 6-26-03
- [www.mthoyoke.edu/~mmremy/haiti.html](http://www.mthoyoke.edu/~mmremy/haiti.html) (deforestation in Haiti) accessed 6-26-03
- [www.charitywire.com](http://www.charitywire.com) (article on “Manure, Paper Waste...”)
- [www.sunoven.com/haiti.asp](http://www.sunoven.com/haiti.asp) (solar oven)
- Earth Matters: Studies for our Global Future. Zero Population Growth, Inc. Washington, 1988.
- Latin America Today, 1997 Revised edition. (background information and statistics)
- <http://svs.gsfc.nasa.gov/vis/a000000/a002600/a002640/> Haiti border
- [www.customcartoonart.com/deforestation.jpg](http://www.customcartoonart.com/deforestation.jpg) Cartoon
- <http://www.nytimes.com/1993/08/28/world/un-lifts-haitian-oil-embargo-as-junta-prepares-to-step-aside.html> accessed 7-6-13
- [http://www.nationmaster.com/graph/agr\\_val\\_add\\_ann\\_gro-agriculture-value-added-annual-growth](http://www.nationmaster.com/graph/agr_val_add_ann_gro-agriculture-value-added-annual-growth) accessed 7-6-13
- <http://data.un.org/countryProfile.aspx?crName=Haiti#Economic> accessed 7-6-13
- <http://data.un.org/countryProfile.aspx?crName=Haiti#Economic> accessed 7-6-13

## Christopher Columbus

This was written by Christopher Columbus to Ferdinand and Isabella, describing the island of Haiti:

**“Its lands are high; there are in it very many sierras and very lofty mountains....All are most beautiful, or a thousand shapes; all are accessible and filled with trees of a thousand kinds and tall, so that they seem to touch the sky. I am told that they never lose their foliage, and this I can believe, for I saw them as green and lovely as they are in Spain in May, and some of them were flowering, some bearing fruit, and some at another stage, according to their nature.”<sup>3</sup>**

3 Excerpted from Julie Sloan Denslow and Christine Padoch. 1988. People of the Tropical Rain Forest. Berkeley: University of California Press

### AGRICULTURE IN HAITI

#### A BRIEF SKETCH ON HAITI FOR THE VISITORS TO THE WORLD'S FAIR AT ST. LOUIS 1904

**The great productiveness of the soil in Haiti is too well established to admit the least doubt. There is no article of commerce produced in the tropics that is not found or could not be produced in Haiti. Apples, peaches, strawberries, blackberries, and other temperate-zone growths are to be found in the uplands. The soil seems to be especially adapted to the cultivation of sugar cane.**

**In tropical fruits which would prove profitable exports a great variety may be listed: Sweet and sour oranges, citrons, lemons, shaddocks, bananas, plantain, pineapples, cocoanuts, mangoes, sapotillas, alligator pears, artichokes, and the like. Probably the most popular of all the fruits of Haiti, except the plantain, which is used as a very nourishing food, at all seasons, is the mango. It is estimated that during the height of the season (May and June) the sale of breadstuffs of all kinds falls off as much as 40 percent on account of the consumption of the mango.**

<http://www.webster.edu/~corbetre/haiti/misctopic/texts/stlouis.htm> accessed 07-06-13

## ***Cards for Cause/Effect Activity***

Cut apart for students

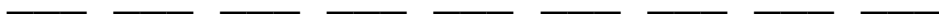
Increase in population	Extinction or endangerment of species
Clearing land for food production (slash and burn)	Soil erosion
Commercial logging of tropical hardwoods	Flooding
Commercial farming – plantation crops (coffee/sugar)	Landslides
Lack of understanding/choices	Climate changes
Political upheaval since 1957	Air pollution
Need for cheap source of fuel	Decline in tourism
US oil embargo and sanctions	Destruction of fishing industry

Education on more sustainable agriculture procedures	Poor soil lacking nutrients
Foreign government aid	Economic instability
Political stability	Hunger
Foreign business investment in Haitian agriculture	Seek alternate energy sources
Graft mango trees for better quality fruit	Solar Ovens
Charcoal provides 71% of Haiti's energy	Replantation of fast growing trees
75% of population lives in poverty	PCI went from \$344 in 1960 to \$228 in 1996
15,000 acres of topsoil wash away each year	Agricultural output dropped 7.2% from 1994-1995
14 of 75 species of birds are in danger of extinction	100 of 5000 species of plants may disappear

# DEFORESTATION IN HAITI

**CAUSES**

**EFFECTS**





## Assignment:

Read the attached articles “Manure, Paper Waste and Corn Stalks Help Halt Deforestation in Haiti” and “Massive savings bring opportunities for destitute families.”

*Think about the benefits and consequences of such a program. (See also Bill Clinton video: [http://www.youtube.com/watch?v=4FBZ\\_WhdQdw](http://www.youtube.com/watch?v=4FBZ_WhdQdw))*

You are running for political office in Haiti (president or prime minister). **Your task is to write a campaign speech** with the issue of deforestation as your platform.

- Create a name for your political party with this in mind.
- You need to educate the common man (woman) of Haiti concerning the problem of deforestation.
- Your speech must explain the two major causes for deforestation in Haiti and the two biggest effects for the average people of Haiti (remember they are the voters).
- Inform your audience why this “manure” project is a good step toward helping to remedy the deforestation situation. Refer to at least two Core Democratic Values in your argument.
- Your speech should last between two and three minutes.

**For extra credit:** you may create a campaign poster to go along with your speech. (This should be poster size. Remember you want to attract attention and get people to vote for you and support your platform.)

### RUBRIC:

Appropriately named political party	2
Two causes of deforestation	6
Two effects of deforestation	6
Core Democratic Values	4
Information on manure project	5
Quality of your argument	5
Time management	3
Delivery	3

See also Bill Clinton video [http://www.youtube.com/watch?v=4FBZ\\_WhdQdw](http://www.youtube.com/watch?v=4FBZ_WhdQdw)

## Manure, Paper Waste and Corn Stalks Help Halt Deforestation in Haiti

World Concern

Monday, 16 April 2001

This Earth Day, as Americans face power blackouts and rising energy costs, remember that many other nations are struggling with ecological crises of their own.

In Haiti, the poorest nation in the Western Hemisphere, 75% of the people live in poverty. One of the primary causes of poverty is the deforestation of the country. Forests once covered over 90% of Haiti, yet after decades of intensive tree cutting for firewood and charcoal, less than 1% of the land remains wooded.

World Concern, a Seattle-based Christian relief and development organization, decided to take on the environmental and economic challenge of deforestation in Haiti. Using a unique technology developed by Dr. Ben Bryant, Professor Emeritus at the University of Washington, the organization teaches families in Haiti to cook and heat their homes using an alternative energy source: the briquette.

Charcoal, inexpensive and reliable, has become the most widely used form of energy in Haiti today. Unfortunately, it is also a major contributor to deforestation. When making charcoal, 80% of the energy in the wood is lost. In addition, the smoke and emissions produced in charcoal kilns create air pollution, global warming and respiratory illnesses. Continued consumption of charcoal in this tiny nation with few forest areas remaining is not sustainable.

Moreover, the destruction of the environment has significant consequences beyond the energy crisis. Farmers, strapped by low farm yields and an insufficient amount of arable land, struggle to produce enough food to feed the population. Unemployment remains over 50%. Families, especially rural families, need income generation sources, jobs or small businesses.

Haitian families make the briquettes in World Concern's program out of manure, leaves, wood scrap like paper waste and corn stalks, materials that are readily available in the communities of Les Cayes, Port-au-Prince, and the Artibonite Valley where the project is located. World Concern teaches women and families to produce, utilize, and sell the briquettes, which cost even less than charcoal.

More than an innovative energy source, World Concern's briquette program provides economic opportunities that will benefit nearly a million people by June 2001. This meets two essential goals of development in Haiti: the creation of jobs and the development of a system that provides sustainable energy and electricity.

<http://www.charitywire.com/00-02120.htm>

## Massive savings bring opportunities for destitute families



Haiti is being deforested at an alarming rate, with 99 percent of its original forest cover destroyed to make charcoal and wood fuel.

The result of deforestation is low agricultural yields, and more poverty. Imported fuel is too expensive for most Haitians.

World Concern has helped by promoting and teaching the production of alternative household fuel “briquettes” made from farm waste such as corn stalks, animal manure, leaves, wood shavings, paper, and even the powder and small pieces of charcoal.

The simple and unique press used to make the briquettes was developed by University of Washington Professor of Wood Utilization Technology, Dr. Ben Bryant, and his associates.

Using the press, Haitian families can make their own cooking fuel and sell briquettes to other families, schools, and businesses for income.

The industrialization of the process can provide briquettes on a large scale to bakeries and laundries that are the major users of firewood and charcoal in Haiti.

Over the past six years, World Concern-Haiti has been working with grassroots organizations and individuals to develop models for making and using briquettes.

We are training grassroots groups on how to make them will also produce and donate briquettes to 700 poor families.

At present, families using briquettes are experiencing a savings of \$250 per year by not purchasing other sources of cooking fuel.

This comes close to the national average annual income for a Haitian family.

The savings can be used for education, housing, food or health care for a family.

[Read how this program affected one Haitian man, saving him one fifth of his income.](#)

## CAUSES

### **Increase in population**

Haiti's population has increased from 3.8 million to 6.9 million in 2000 and almost 9 million today with a growth rate of 2.4%, and there is an ever growing need for space for the people to live as well as greater use of resources.

### **Clearing land for food production (slash and burn)**

The increase in population has naturally led to an increased demand for food. Slash and burn is the common method of clearing land in Haiti making soils useful for only two or three years. Most of this farming, however, is subsistence farming. (see overhead #5)

### **Commercial logging of tropical hardwoods**

As early as the 1904 St. Louis World's Fair, Haiti was much desired for its tropical hardwoods such as ironwood, mahogany, logwood and acacia for export products including furniture.

### **Commercial farming – plantation crops (coffee/sugar)**

Largely as a result of French colonization, much land in Haiti was cleared for coffee and sugar plantations as well as rubber during WWI for export to Europe and other areas. Also consider the added need for wood to fuel the factories.

### **Lack of understanding/choices**

There is a general lack of understanding and no other sustainable choices for the people of Haiti (who lack even a basic education) about the importance of preserving the forests. They can only see their immediate needs of food and fuel (which cannot be ignored).

### **Political upheaval since 1957**

Haiti has been an independent nation since driving out the French in 1804. They formed a parliamentary government with written constitution. In 200 years they have had 20 constitutions, 16 presidents for life and numerous kings and dictators. Since 1957 and the Duvalier family (Papa and Baby Doc), corruption and dictatorship have made change in Haiti very difficult. International organizations have frequently found working conditions in Haiti unsafe at best. Things did not improve as hoped with Aristide and subsequent Organization of American States (OAS) embargos or with the following government of Rene Preval. President Michel Martelly was elected in 2011.

### **Need for cheap source of fuel**

The only source for fuel for most Haitians is the available charcoal (BLACK GOLD) available made especially from pine trees. There is very little oil or natural gas available or affordable and Haiti has little to trade for it. As a result, many Haitians sell buckets of charcoal on the street corners as their only source of income.

### **US Oil Embargo**

With the deteriorating political situation of the late 1990s in Haiti, the US blocked shipments of fuel to Haiti. This led to increased deforestation as Haitians cut trees for fuel. This, in turn, increased the problems with soil erosion. Haitians found it more difficult to farm without fuel for equipment. Water was used for hydro-electricity for the capital and, therefore was not available for irrigation. Pesticides and fertilizers were also unavailable. The embargo has since been lifted.

# EFFECTS

## **Extinction or endangerment of species**

As we all know, rainforests provide the greatest variety of plant and animal life on earth. Fourteen of 75 species of birds and 100 of 5,000 species of plant are in danger of extinction in Haiti as well as the forest itself. Native birds include Hispaniolan parrot, parakeet, chat, tanager, white winged warbler.

## **Soil erosion**

Without the tree roots to hold in the soil, precious topsoil is washing away in this tropical climate at an alarming rate of 15,000 acres a year.

## **Flooding**

Remember, Haiti has a tropical climate with frequent rains and dangers of hurricanes as well. The danger of flooding is intensified because trees are not available for holding back the waters and landslides frequently result further endangering forests and human life as well as valuable farmland.

**Landslides (see above)** Consider recent earthquake damage

## **Climate changes**

The importance of the hydrological cycle and the rainforest to climate is well known. The resulting changes in climate, therefore, also affect the growing season compounding the problem.

## **Air pollution**

Two factors are important here. One deals with the changed oxygen levels because of the destruction of the forest. More directly apparent is the pollution caused by the burning of charcoal as the main source of fuel. Charcoal provides 71% of Haiti's energy.

## **Decline in tourism**

What was once a tropical paradise is now a barren land. There are very few tourist resorts left to enjoy in Haiti because the tropical waters have also been affected.

## **Destruction of fishing industry**

The effect is not immediately apparent. Remember that soil erosion, flooding, and landslides are direct results of deforestation. Sharing the island of Hispaniola with the Dominican Republic means that Haiti is surrounded by water on three sides. Fishing used to be a major industry for Haitians on the Caribbean; however, soil washing into the sea has killed fish as well as the change in water temperature with no tree cover to cool the tropical waters. (see cartoon)

## **Poor soil lacking nutrients**

Slash and burn agriculture zaps the nutrients from the soil. Much of the land in Haiti has never been good for agriculture, yet trees thrived. The increasing population has led to an increased need for food; therefore already poor soils are suffering from overuse. Agricultural output dropped 7.2% from 1994-1995.

## **Economic instability**

Haiti is the poorest country in the Western Hemisphere. 75% of the population lives in poverty. The per capita income (PCI) dropped from \$344 in 1960 to \$228 in 1996. Without any sustainable source

of income, there was little hope of this improving. However, with international help, per capita income reached \$611 by 2010, but recent natural disasters have negatively affected the economy

### **Hunger**

Water is not available for irrigation and with no fertilizer or pesticides agricultural output continues to decline.

## **SOLUTIONS**

### **Replantation of fast growing trees**

There is currently no organized government program of replantation. Haiti needs trees that can provide an income as well as produce roots and foliage that will help reduce some of the effects of deforestation. Recently President Michel Martelly announced he will launch the drive to double forest cover by 2016.

### **Seek alternate energy sources**

Continuing to burn charcoal will only harm the environment in many ways. Privately funded programs are in place to educate the people for the need to use alternate energy sources including kerosene. There is also an interesting solution under study to use manure, paper waste and corn stalks to provide alternate energy (**see article**: “Manure, Paper Waste and Corn Stalks Help Halt Deforestation in Haiti”).

### **Solar ovens**

SUN OVENS International, Inc has developed an alternative to charcoal heating that can help Haiti and other developing countries. (see overhead #8)

### **Foreign business investment in Haitian agriculture**

There is no money available in Haiti’s depressed and unstable economy to invest in profitable agriculture. They are only trying to survive and most farming is subsistence. Foreign dollars are necessary to make a change for the people of Haiti (not for business profit).

### **Political stability**

Although not either a direct cause or effect of deforestation, it is hard to initiate change in Haiti without political stability. Foreign governments, the United Nations, and the Organization of American States have taken a more active role in helping to achieve and maintain stability.

### **Foreign government aid**

(see above). This may take the form of loans, humanitarian aid, education, etc.

### **Education on more sustainable agriculture procedures**

(see above and below).

### **Graft mango trees for better quality fruit**

Mangos have and continue to grow well in Haiti’s tropical climate. However, most of the mango trees produce low quality fruit so the trees are cut down for fuel or other wood products. There is a highly desired and profitable variety (Mme Francique) which can be grown through grafting and produce between \$50 and \$100 per tree a year. (**overhead #7**)

## DEFORESTATION IN HAITI

### CAUSES

- Increase in population
- Clearing of land for food
- Commercial logging of hardwoods
- Commercial farming plantation crops
- Lack of understanding
- Political Upheaval
- US Oil Embargo

### EFFECTS

- extinction or endangerment of species**  
14 of 75 species of birds in danger  
100 of 5000 species of plants
- soil erosion**  
15,000 acres of topsoil wash away yearly
- flooding/landslides**
- hunger**
- Climate changes**
- Air pollution**  
Charcoal provides 71% of energy
- Decline in tourism**
- Destruction of fishing industry**
- Poor soil lacking nutrients**  
Agricultural output dropped 7.2% from 1994-1995
- Economic instability**  
75% of population lives in poverty  
PCI drops from \$344 to \$248 (1960-1996)

## SOLUTIONS

- |   |                                    |
|---|------------------------------------|
| Replantation of fast growing trees        | Seek alternate energy sources      |
| Foreign business invest in agriculture    | Political Stability                |
| Foreign governmental aid                  | Graft mango trees for better fruit |
| Education on more sustainable agriculture |                                    |