People and Place
Curriculum Resources on Human-Environmental Interactions

Hemispheres is a joint project of:
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People and Place
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Final Version
Original Compilation Date: June 2005
Final Publication Date: April 2007

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TEACHER NOTES

GOALS
This case study will help students analyze and interpret graphic information on an issue—water conservation and use—through the examination of big dam construction in India. Students should come away from this unit with three understandings: (1) that dam construction has positive and negative effects on people and the environment; (2) that population growth and food production are interrelated; and (3) that study results can be interpreted and skewed to present a point of view.

ASSESSMENT EVIDENCE
Write a Point of View Article: In this activity students are asked to take a position on a specified topic and express their point of view as a newspaper editorialist. This activity is designed to help students understand how point of view can influence how data and information are interpreted. To write a successful article, students will demonstrate their understanding of the information in this unit by incorporating data from the charts, tables, maps, and readings.

LEARNING ACTIVITIES
• Word Web focuses your students’ attention on a few vocabulary words by free associating their ideas in a way that has neither right nor wrong answers. This introductory activity gets your students to think about the pros and cons of big dam construction.
• Take a Stand also introduces the topic of big dam construction in India, but allows students to express and change their opinions as they move about the room.
• The Green Revolution in India reading briefly introduces the pros and cons of big dam construction in India and looks at the needs of a country’s citizens for food as the population increases.
• The Comparing Information on India: Reading and Understanding Different Sources activity helps your students extract and compare information from readings and graphs.
• The Reading and Comparing Maps of India worksheet was created to help your students extract, compare, and analyze information contained in different kinds of maps. It was developed as a class discussion, but could be done in small groups or individually.
• Narmada Dam: Interpreting Point of View was created to help your students understand the concept of point of view and how point of view can influence data interpretation.
Word Web

(1) Write a term (choose from, or complete each of the following separately: POPULATION GROWTH, BIG DAMS, and FOOD PRODUCTION) in the middle of the chalkboard. Tell students that you want them to think of possible environmental and social consequences related to each term. You may want to provide an example such as: “big dams” . . . might mean “more water for irrigation,” which may lead to “being able to grow more food.” Tell students that there are no right or wrong answers, but ask them to explain their proposed connections. They need to understand that the cause-and-effect relationship can be positive, negative, or neutral.

(2) Build the word map on the board. You can invite students up to the board to add onto the central concept or to build upon someone else’s ideas. For each concept that is added, arrows should be used to show a cause-and-effect relationship.

(3) After all students have contributed to the word web, walk them through it starting from the middle. You may wish to ask individual students to explain their additions and see if others in the class agree or disagree.
Take a Stand

It is sometimes easier to think through an issue if you are asked to “take a stand” on it. For this activity, students are asked to take a position and articulate their views on several issues related to the construction of big dams in India.

Materials needed: Signs to post around the classroom (Strongly Agree, Agree, Undecided, Disagree, and Strongly Disagree) and masking tape.

Procedure:
(1) Tape the signs onto the walls around the classroom.
(2) Explain to the students that you will be reading several statements to them, and that they should stand in front of the sign that most closely represents their reaction to the statement you’ve read. Use your discretion in choosing from the statements below. Students will then be asked to explain their particular stand on each issue. They are free to move to a different sign if/when their opinions change after hearing their classmates’ views.
(3) When facilitating the activity, try to give equal time to representatives of different sides of the issue and solicit remarks from as many students as possible. Do not let your opinions show, but you may pose questions to help students articulate their thoughts.

Statements:
• In an effort to feed a growing population, every citizen should voluntarily eat less.
• Arable land should not be used for anything but farming. It should never be used for apartments, shopping malls, government buildings, etc.
• The government has the right to make all decisions about the country’s natural resources and how they are used.
• A river belongs to the people who live on or near it. They have the right to make all the decisions about how the river is used.
• Any dam construction that threatens the way of life of people living on or near the river should be prohibited.
• The government should put a higher priority on feeding all of its citizens rather than on preserving the ways of life of some of its citizens.

The Green Revolution in India
The world’s worst recorded food disaster happened in 1943, when an estimated 4 million people in eastern India died. At the time, people believed the Bengal Famine happened because India’s farmers could not produce enough food to feed everyone. Food security—ensuring sufficient food production to feed a country’s people—became the Indian government’s biggest priority. “Green Revolution” is the term that refers to the governmental focus on food production in India from 1967–1978. Previously, the country had focused on expanding the amount of land under cultivation, but as the population continued to increase at a much faster rate than food production, the government changed its focus. During the Green Revolution, attention turned to improving farming techniques.

There were three basic parts of the Green Revolution in India: (1) expansion of farming areas; (2) double cropping technique; and (3) improved seed genetics. Double cropping, harvesting two crops per year, was the primary feature of India’s Green Revolution and required a steady supply of water. To make this possible, the government began construction of a network of large dams. Dams are able to conserve monsoons rains and irrigate crops all year, especially useful during the dry season.

In India, agriculture employs about two-thirds of the workforce and is the most important economic sector. Since the 1950s, there has been a 2.5% average yearly increase in crop output, mostly due to yield—how much food a plant or seed produces—and not to an increase in the amount of land being farmed. With the Green Revolution, the production of rice, the staple food of southeast India, increased by 350% and the production of wheat, the staple in the northwest, increased nearly 850%.

On the other hand, creating a network of dams displaces people. These people, for the most part, are poor rural farmers. There are no official records of the numbers of displaced people in India, and estimates vary widely. One of the highest estimates comes from an Indian Institute of Public Administration study, which claims that 415 million (about one quarter of India’s total population) have been displaced. A different study, done by the International Rivers Network, claims that 3.7 million people have been displaced.

One of the most controversial development projects in India is on the Narmada River. The completed project will include a network of 3,200 dams on the river and its tributaries. The first dam on the Narmada River was completed in 1990. It is reported that 114,000 people were displaced, and it irrigated only 5% of the land it was expected to irrigate. Almost two-thirds of the people displaced by dams belong to socially oppressed groups (low caste) who have the lowest incomes among the country’s poor. In addition, many of these village communities have a strong relationship with the land they live on and breaking apart the communities to relocate them threatens their age-old way of life.

Note: Green Revolution is a general term used to refer to agricultural improvements in the developing world and is not specific to India.

Sources:
Saby Ganguly. From the Bengal Famine to the Green Revolution, http://www.indiaonestop.com/Greenrevolution.htm
India Food-Grain Production. The Library of Congress Country Studies; CIA World Factbook.
## India’s Foodgrain Production and Census Data

![India's Foodgrain Production, 1950/51-1998/99](image)

Source: Based on data from Directorate of Economics and Statistics (a), Ministry of Finance.

<table>
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<th>Census Year</th>
<th>Population (in Lakhs*)</th>
<th>Decimal Growth Rate</th>
<th>Geometric Growth Rate</th>
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<td>1901</td>
<td>2384.0</td>
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<td>1911</td>
<td>2520.9</td>
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<tr>
<td>1921</td>
<td>2513.2</td>
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<td>2789.8</td>
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<td>14.22</td>
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<td>1991</td>
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</tr>
</tbody>
</table>

* Lakh is a Hindi measurement term that equals 100,000.

Note: Census Data does not include states of Jammu & Kashmir.

Source: Registrar General of India.
Comparing Information on India: Reading and Understanding Different Sources

Comprehension Exercises

(1) Please explain, in your own words, the three parts of the Green Revolution in India. Also, explain why the government chose to focus on these three types of projects.

(2) Look at the India’s Foodgrain Production graph and look closely at the Green Revolution in India reading. What might have caused the rise in food production in the 1990s? What are the negative effects of this project?

(3) Does the information in the food production graph match the information in the reading? Explain your answer by comparing data from the two sources.

(4) Use the census data to determine when the large population increases began. According to the reading, what happened at this time? And what did the government believe was the cause?

(5) Based on the food production graph and the reading, do you think the Green Revolution was a success? Why or why not?
Big Dam Construction in India

Dams In India

Agricultural Map
(FOOD CROPS)

McDonald’s in India

Source: McDonald’s India, http://www.mcdonaldsindia.com
Monsoon Onset in South Asia

Source: 1994. Syracuse University Cartographic Lab. (Permission pending.)
Reading and Comparing Maps of India

Look at the maps in this unit: Dams in India, Agricultural Map (Food Crops), McDonald’s in India, and Monsoon Onset in South Asia. Compare information in these maps to answer the following questions.

(1) Where are the most dams located?

(2) What crop is grown near those dams?

(3) Why do you think there are a lot of dams in this area?

(4) Of the three foodgrain crops on the map, which do you think is important to the McDonald’s menu and why?

(5) Why do you think the McDonald’s are located where they are? (Hint: Look at the staple foods from the different regions of India in the reading.)

(6) In what general direction do the summer monsoon winds blow?

(7) How are summer monsoons helpful to farmers?

(8) What food crops are grown in the area of the June 10th onset?

(9) What food crops are grown in the area of the June 15th onset?
Narmada Dam: Benefits and Costs
Interpreting Point of View

Benefit and cost analysis studies conducted by the Indian government and by three independent non-government groups (grouped as “Studies” in graph).


(1) On which topic do the government study and the independent study have the most similar estimates?

(2) Which topic shows the greatest difference between the two studies?

(3) What do you notice about the government study’s estimates? What do you notice about the independent study’s estimates?

(4) How can you explain the difference in estimate numbers in each study?

(5) The chart was produced by a non-governmental organization. Does this change your explanation for the difference in estimates? Why or why not?
Write an Editorial

Imagine that you are a newspaper reporter. Write an editorial or opinion piece for your newspaper that expresses your point of view on the following statement: The Indian government should put a higher priority on feeding all of its citizens rather than on preserving the traditional way of life of some of its citizens.

To support your point of view, remember to consider the context of India; the information you learned about the pros and cons of big dam construction, foodgrain production, and population growth; and the facts you found in the charts, tables, and maps.
Created in 1996, Hemispheres is the international outreach consortium at the University of Texas at Austin. Hemispheres utilizes University resources to promote and assist with world studies education for K-12 and postsecondary schools, businesses, civic and non-profit organizations, the media, governmental agencies, and the general public.

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