BRITANNICA GLOBAL GEOGRAPHY SYSTEM

Overview

BGGS Overview



BGGS is the Britannica Global Geography System, a modular electronic learning system which combines the latest pedagogical approach to geogra-

phy learning with interactive multi-media materials enabling students and teachers to immerse themselves in exciting geographic investigations. BGGS is made up of the following components:

- Geographic Inquiry into Global Issues (GIGI) Student DataBooks
- Teacher's Guides with Overhead Transparencies in a three-ring binder
- Laminated Mini-Atlases to accompany each module
- · BGGS CD-ROM with User's Manual
- 3 BGGS Videodiscs with Barcode Guides
- 3 thematic posters

This section of your Teacher's Guide will examine each component and demonstrate how the components work together to facilitate some very exciting geography learning for you and your students!

I. GIGI

Geographic Inquiry into Global Issues (GIGI) is the foundation of the BGGS. GIGI is a series of modules developed at the Center for Geographic Education at the University of Colorado at Boulder. The modules are independent of one another and can be presented in any order.

They use an inquiry approach and are organized around ten world regions:

South Asia

Southeast Asia

Japan

Former Soviet Union

East Asia

Australia/New Zealand/Pacific

North Africa/Southwest Asia

Africa-South of the Sahara

Latin America

Europe

Each GIGI module is centered around a particular question, such as "Why are people in the world hungry?" and "Is freedom of movement a basic human right?" The lead question is explored in one region of the world, then, in most modules, in a second region, before being investigated in North America.

The modules can be used in geography classes, or selected modules can be used in other courses, such as Earth Science, Global Studies, or Economics. Twelve modules constitute ample material for a full year's geography course. Each module is accompanied by sets of laminated mini-atlases which students can write on with dry-erase markers (provided by the teacher), then wipe clean to be re-used by the next class. This activity works well with cooperative groups of students.

BRITANNICA GLOBAL GEOGRAPHY SYSTEM

Each module comprises a Teacher's Guide in a three-ring binder which includes Handouts and Activity masters for duplication and Overhead Transparencies; twenty-five Student DataBooks (additional Student DataBooks available) and the Mini-Atlases all packaged in a sturdy box suitable for storage when the class moves on to the next module. Since the Student DataBooks are soft-covered three-hole punched, nonconsumable books, we recommend that each student have a binder to protect them. BGGS binders are available from Britannica, or you might ask each student to obtain one at the beginning of the course to keep the books in good condition for the next group of students that will use them. As the class completes a module, you can collect the Student DataBooks, place them in their storage box, and distribute the next module's DataBook to be placed in the student's binder.

GIGI print materials are organized in a unique fashion. The Teacher's Guide explains procedures to use in presenting the material found in the GIGI Student DataBook. Miniature layouts of student pages show the teacher how many pages of student material correspond with a given Teacher's Guide page. The Teacher's Guide includes Activities and Handouts to be copied and passed out to the class and Overhead Transparencies to enhance each lesson. All of a module's Activities, Handouts, and Overheads are located behind the third tab divider in each Teacher's Guide.

The teacher needs to become familiar in advance with both Teacher and Student material in order to effectively engage the class in meaningful geographic inquiries. There is a comprehensive "Memo to the Teacher from the GIGI Staff" in each Teacher's Guide which explains in detail the

goals and principles behind the inquiry approach to geography learning.

The electronic components of the *Britannica Global Geography System* further empower students and teachers alike to engage in meaningful investigations. They are explained in detail in the following section.

II. BGGS CD-ROM

The BGGS CD-ROM is a resource manager and reference tool designed to help both teachers and students get maximum impact from the *Britannica Global Geography System*. This CD-ROM contains the text of the GIGI Student DataBooks in both Spanish and English, as well as Britannica's innovative geography reference program Geopedia™ all on a single disk. Here are some of the ways you and your class can use this software:

• When preparing to teach a module, you can access the GIGI Student DataBook on the CD to find which other elements of the BGGS are keyed to that lesson. For example, if you are teaching Lesson 3 in the Population and Resources module (What is overpopulation and how is it distributed?), accessing that lesson on the CD-ROM will reveal that there is one clip on the Economic Development videodisc called "Population/Wealth Correlation." With this information, you can plan when to reserve your department's videodisc player to preview the clip and show it to your class.

Furthermore, you will discover that there is one GIGI mini-atlas activity related to this lesson, five articles in the Geopedia database, ten entries in

BRITANNICA GLOBAL GEOGRAPHY SYSTEM

Geopedia's World Data, five maps in the Geopedia Atlas, and five learning activities in the Geopedia BrainTeasers. You may want to assign each student or small group of students a research project using these extra resources to be done over the course of the module, or you can create a set of questions which the students must complete using the information found in Geopedia.

These activities can serve as a performance-based assessment of what students have learned in studying each module.

Since many schools have a limited number of computers with CD-ROM drives available, you may wish to devise a rotating schedule or sign-up system to ensure that each student has a chance to get at the BGGS CD-ROM. If it takes 15 class periods for a class of twenty-five students to do one module, students working in pairs can each have one turn at the computer if they schedule their time at the outset of the module. Using the CD-ROM's resource managing capability, you will have a very good sense of what resources you have at your disposal and how to make the most of them.

• All GIGI lessons are indexed by word and by key topic. If your class is studying food shortages in the Hunger module, you can key in the word hunger, and immediately learn where else in the GIGI modules this word or key topic appears. You can go directly to those occurrences in the text. You will also be directed to appropriate Geopedia references and Brain Teaser activities. Figures, Maps and Tables from GIGI print modules do not appear in the CD-ROM. However, the caption describing each of them is part of the online text. If Spanish is the primary language of your students, GIGI lessons can be accessed and printed out in Spanish from the BGGS CD-ROM. The BGGS Videodiscs have a Spanish soundtrack as well.

III. BGGS Videodiscs

More than ever before, today's students are visual learners. The GIGI modules explore issues and regions of the world with which many students are unfamiliar. With this in mind, we have produced three videodiscs, one to correspond to each of three major strands we have identified in GIGI: Earth's Environment and Society; Economic Development; and Global Political and Cultural Change.

These videodiscs, with English and Spanish soundtracks, can take you and your class to the parts of the world you are investigating with the wave of a barcode wand. Your class will hear how Amazon native peoples feel about the exploitation of the tropical rain forests where they live, witness the eruption of a volcano, and see first-hand the environmental disasters human beings have brought about.

The Barcode Guide which accompanies each disc enables you to access with a light pen or barcode reader, segments which pertain to the lesson being investigated. The Guide includes barcodes in both English and Spanish. Teachers can use the segments to enrich lessons, and students can make use of segments to enhance a report or group presentation.

There is a full-color poster to accompany each videodisc cluster which engages the students by asking "How do these images connect to you?" The posters can provide a colorful springboard for classroom discussion.

BRITANNICA GLOBAL GEOGRAPHY SYSTEM

Britannica Global Geography System Developers

GIGI Staff and Associates

Professor A. David Hill, Director and Developer

Dr. James M. Dunn, Developer

Dr. Phil Klein, Developer

Professor Robert W. Richburg, Consultant and Evaluator

Dr. Alan L. Backler, Consultant

Professor Joseph P. Stoltman, Consultant

Dr. H. Michael Hartoonian, Consultant

Lynn M. Jackson, Secretary

Sheila B. Tyrrell, Secretary

Jeffrey Jon Miller, Assistant

Aaron Howell, Assistant

Mathilde Snel, Assistant

Bryan Dorsey, Assistant

See individual modules for additional contributors.

EBEC Staff and Associates

Emily Clott, Project Manager

Martha Hopkins, Director, Educational

Program Development

Proof Positive/Farrowlyne Assoc., Editorial,

Design, and Production

Hazel Janke, Manufacturing Manager

Carol Smith, Senior Buyer

Richard Laurent, Logo and Package Design

Alison Witt-Janssen, Electronic Production

Manager

Jeffrey Osier, Videodisc Editor

Dynacom, Inc. Software Development

Sharon Johnson, Videodisc Development and

Photo Research

Laurie Kennard, Videodisc Development and

Photo Research

Jean Araujo, Editorial Coordinator

Patrick Hogan, CD-ROM User's Manual Editor

Kim Bradshaw, Data Preparation

Carmen Schwarting, Data Preparation

Yolanda Vargas, Data Preparation

Alejandra Tcachuk, Translator

Dave Alexovich, Video Animation and Graphics

Dave Wood, Video Animation and Graphics

Scott Shearer, Video Animation and Graphics

Barbra A. Vogel, Manager EB Cartography

Dione E. Fortin, Cartography

Steven Bogdan, Cartography

Amelia R. Gintautas, Cartography

Michael D. Nutter, Cartography

BRITANNICA GLOBAL GEOGRAPHY SYSTEM

GIGI

Geographic Inquiry into Global Issues

Development

Program Developers

A. David Hill, James M. Dunn, and Phil Klein

TEACHER'S GUIDE

Regional Case Study Latin America



Geographic Inquiry into Global Issues (GIGI)

The Center for Geography Education Department of Geography, Box 260 University of Colorado at Boulder Boulder, CO 80309-0260

GIGI Project Staff

A. David Hill, Director James M. Dunn Phil Klein

Project Consultants

Alan Backler Michael Hartoonian Robert Richburg Joseph P. Stoltman

Development

First draft written by Vicki McVey Additional materials by Jeffrey Jon Miller

EBEC Production Staff and Associates

Project Manager: Emily Clott Director, Educational Product Development: Martha Hopkins Design, Editorial, Production: Proof Positive/Farrowlyne Associates, Inc. Senior Buyer: Hazel Janke Logo and Package Design: Richard Laurent

ISBN 0-7826-0984-8

Copyright © 1995 The Regents of the University of Colorado, a Body Corporate

Copyright © 1995 Encyclopædia Britannica Educational Corporation

The contents of this book may not be reproduced by any means, electronic or mechanical, including photocopying, except for classroom sets of Activities.

This material is based upon work supported by the National Science Foundation under Grant No. ESI 9050204. The Government has certain rights in this material. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors, and do not necessarily reflect the views of the National Science Foundation.

Contents

Memo to the Teacher from the GIGI Staff iv Preparing to Teach This Module: Development xvii

The Global Setting of the Issue

Lesson 1 What is development? 1

Major Case Study: Amazonia

Lesson 2 What is the Amazon environment like? 7

Lesson 3 What forces are driving development in the Amazon? 13

Lesson 4 How is development threatening native cultures in the Amazon? 20

Lesson 5 Is sustainable development likely in the Amazon? 27

Comparison Case: Eastern Europe

What environmental problems has development caused in Eastern Europe? 34

Comparison Case: United States

Lesson 7 How has development affected the Tennessee valley? 38

Memo to the Teacher from the GIGI Staff

You have in your hands the GIGI Teacher's Guide. Teaching with GIGI is a departure from teaching with a conventional textbook. By taking the time to study this memo—about 30 minutes—you will gain a good understanding of the kind of teaching that's needed to be successful with GIGI. We hope you have a rewarding and enjoyable experience!

Goals

The three major goals of *Geographic Inquiry into Global Issues* (GIGI) are to help you teach your students the following:

- 1. Responsible citizenship
- 2. Geographic knowledge, skills, and perspectives
- 3. Critical and reflective thinking

We believe you can accomplish these goals as well as others by teaching real-world issues. GIGI presents these issues with an inquiry approach, using the information, concepts, skills, and perspectives of geography.

GIGI and the Britannica Global Geography System

GIGI offers you two instructional modules for each of ten world regions (Figure 1 on pages vi and vii). There is no necessary sequence of modules; each one is independent, so you can use them in any order you wish or put together smaller clusters of modules to fit your needs. A leading question frames the issue of each module, and student inquiry proceeds through a sequence of lessons, each of which requires one or more daily periods of class time.

Color photographs at the beginning and end of each Student DataBook graphically illustrate the topic under inquiry.

Modules typically begin with a broad introduction to the global issue. Then, a major case study of three to four lessons examines the issue in a real place within the selected world region. Students also explore, usually in a single lesson, a comparative case study in a different region, which gives a variant of the issue and a sense of its global nature. Modules also bring the students "back home" to focus on the issue as it may appear in the United States or Canada. We do this because although North America is not one of the 10 GIGI

regions, frequent comparisons to North America throughout each module achieve additional instruction on this "home region."

Each GIGI module requires from two to three weeks of teaching time (10 to 15 class periods of 50 minutes) and contains a Student DataBook, Teacher's Guide, and Mini-Atlas. These GIGI print materials are at the heart of the Britannica Global Geography System (BGGS), which extends and enhances the inquiry approach to real-world issues with a CD-ROM and three videodiscs.

The BGGS CD-ROM puts the text of the GIGI Student DataBooks on line in both English and Spanish, then enables both teacher and students to search the text by lesson, key topic, or word to find the resources in the system that will enhance each. GeopediaTM, Britannica's multimedia geography program, is provided in the CD-ROM for follow-up research. It features an atlas with more than 1,000 new maps, an encyclopedia with more than 1,200 geography-related articles, statistical information on every country from Britannica World Data Annual, a chartmaker for creating charts and graphs, a selection of video clips exploring cities and regions, and an electronic notepad allowing teachers and students to clip and edit text right on the screen.

Three videodiscs, designed to electronically transport students to the regions of the world where GIGI case studies are focused, are another part of the BGGS. The discs emphasize three major strands of the GIGI investigations: Earth's Environment and Society, Economic Development, and Global Political and Cultural Change. Each videodisc has two soundtracks, English and Spanish, and is accompanied by a Barcode Guide that enables teachers and students to access the segments that accompany the GIGI lesson with a wave of the barcode reader. A poster accompanies each videodisc to reinforce the connnections between your students and the issue being studied.

A full explanation of the Britannica Global Geography System components and how they work together is located in the BGGS overview in the front section of this Teacher's Guide.

Geographic Inquiry into Global Issues (GIGI)

Issues, Leading Questions, and Case Study Locations

South Asia

Population and Resources

How does population growth affect resource availability? Bangladesh (Haiti)

Religious Conflict*

Where do religious differences contribute to conflict? Kashmir (Northern Ireland)

Southeast Asia

Sustainable Agriculture

How can the world achieve sustainable agriculture? Malaysia (Cameroon, Western United States)

Human Rights

How is freedom of movement a basic human right? Cambodia (Cuba, United States)

Japan

Global Economy*

How does trade shape the global economy? Japan (Colombia, United States)

Natural Hazards

Why do the effects of natural hazards vary from place to place? Japan (Bangladesh, United States)

Former Soviet Union

Diversity and Nationalism*

How do nations cope with cultural diversity? Commonwealth of Independent States (Brazil, United States)

Environmental Pollution

What are the effects of severe environmental pollution? Aral Sea (Madagascar, United States)

East Asia

Population Growth*

How is population growth to be managed? China (United States)

Political Change

How does political change affect peoples and places? Hong Kong (South Korea, Taiwan, Singapore, Canada)

Figure 1

Matrix showing GIGI modules. Geographic issues are in bold and leading questions are in italics. Major case study locations are followed by comparison examples in parentheses.

^{*} Under development

Geographic Inquiry into Global Issues (GIGI)

Issues, Leading Questions, and Case Study Locations

Australia/ New Zealand/ Pacific

Global Climate Change

What could happen if global warming occurs? Australia and New Zealand (Developing Countries, U.S. Gulf Coast)

Interdependence*

What are the causes and effects of global interdependence? Australia (Falkland Islands, United States)

North Africa/ Southwest Asia

Oil and Society*

How have oil riches changed nations? Saudi Arabia (Venezuela, Alaska)

Hunger

Why are people hungry? Sudan (India, Canada)

Africa—south of the Sahara

Building New Nations*

How are nation-states built? Nigeria (South Africa, Canada)

Infant and Child Mortality

Why do so many children suffer from poor health? Central Africa (United States)

Latin America

Urban Growth

What are the causes and effects of rapid urbanization and urban growth? Mexico (United States)

Development

How does development affect peoples and places? Amazonia (Eastern Europe, U.S. Tennessee Valley)

Europe

Regional Integration*

What are the advantages of and barriers to regional integration? Europe (United States, Mexico,

Canada)

Waste Management

Why is waste management both a local and global concern? Western Europe (Japan, United States)

^{*} Under development

The Student DataBook contains the following features:

- Memo to the Student from the GIGI Staff
- An overview of the key questions and places explored in the module
- Lesson objectives
- Data presented in a variety of forms, including text, maps, graphs, tables, photographs, and cartoons
- Questions
- Glossary
- References

Students are not expected to learn the GIGI curriculum through the Student DataBook alone. Rather, they derive meaning from the DataBook when you use the Teacher's Guide to work through the curriculum with them. You may want to explain this process to students. Point out that you will be directing them to carry out various activities that are not specified in their text but are important in the sequence of learning.

Prior to teaching the first lesson, be sure students read the "Memo to the Student from the GIGI Staff" and the two-page overview, which gives the module's objectives in question form. Point out the Glossary and encourage its use as you work through the module, noting that glossary words are listed at the beginning of each lesson. So that students will know what they are expected to learn, they need to read carefully and understand the objectives listed at the beginning of each lesson.

This Teacher's Guide contains the following sections:

- Preparing to Teach This Module, a synopsis of the module's leading question, themes, and activities
- Module Objectives
- · Number of Days Required to Teach the Module
- Suggestions for Teacher Reading
- Extension Activities and Resources

Most lessons include the following sections:

- Time Required
- · Materials Needed
- Glossary Words
- Getting Started (suggested anticipatory sets)
- · Procedures (for group and individual work)
- Modifications for older or younger students (in a different type face, printed in color)
- Questions and Answers (shown in tinted boxes)
- For Further Inquiry (suggestions for extensions and/or assessments)

 Masters of Overhead Transparencies and Activity masters and keys (located at the back of the Teacher's Guide)

Each module has its own accompanying Mini-Atlas, which provides four-color maps designed especially for use with that module. The Teacher's Guide explains how to use these maps. No additional atlases are required to teach the module, but large wall maps are highly recommended for your classroom. In addition to the maps in the Mini-Atlas, you will find numerous maps in the Student DataBook.

Intended Grade Levels

We believe GIGI enables you to probe global issues in various degrees of depth. This allows for the modules' use both over several grade levels (7–12) and over varying lengths of time at a grade level. The Teacher's Guides suggest alternatives for modifying instruction for different grade levels where appropriate. The reading level varies within each module: The Student DataBooks are approximately at grade 9 level, but some extracts from other sources are more challenging. These extracts are important because they show students that many people have contributed to the data, but younger students may need more time and help to understand them. The Teacher's Guides also include extension activities and resources that can maximize the grade-level flexibility of each module. Using the visuals included in the BGGS videodiscs and the activities built into the CD-ROM, you can further tailor instruction to your students. Obviously, you will determine whether particular lessons suit your students' abilities. When a range of required teaching time is given for a module, for example, 10 to 12 days, the greater amount of time should be planned for younger students. If you believe a lesson might be too difficult for your students, eliminate or simplify it. Rarely will the elimination of a lesson render a module ineffective. On the other hand, try to utilize the suggested extensions if the lesson does not adequately challenge your students.

Issues-Based Geographic Inquiry

In order to foster active learning and higher-level thinking, GIGI stresses issues-based geographic inquiry. Inquiry is essentially the method of science and of good detective work: It poses questions and proposes answers about the real world and it tests its answers with real data. Students do this with GIGI. Because this approach may be different from what students are familiar with, you may wish to pre-

pare them by describing the process and its connection to the real world. Also, their reading and discussion of the "Memo to the Student from the GIGI Staff" will help them understand the inquiry approach. GIGI is based on Frances Slater's inquiry activity planning model (1993). To reach GIGI's goals, your students study specific global issues by pursuing answers to geographic questions (Figure 2). They answer these questions by analyzing and evaluating data, using geographic methods and skills. This "doing geography" approach leads to significant outcomes in knowledge, skills, and perspectives. The progression from questions to generalizations "is crucial as a structure for activity planning and as a strategy for developing meaning and understanding. Meaning and understanding define the process of tying little factual knots of information into bigger general knots so that geography begins to make sense, not as a heap of isolated facts but as a network of ideas and procedures" (Slater 1993, page 60).

In truly free inquiry, students work independently, but with GIGI posing questions and providing data, you and your students explore the issues together. This approach supports and encourages your students in learning geography.

By using issues-based inquiry, you promote the development of a critical perspective in your students. They learn the habits of critical and reflective thinking. Multiple and opposing positions are inherent

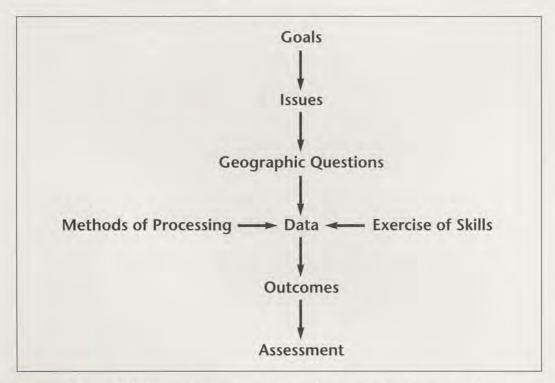


Figure 2 GIGI's model for issues-based geographic inquiry (after Slater 1993).

in these issues. Facts can be used to support different points of view. This is the context in which the habits of the critical perspective can develop, and *interpretation* is the key activity. With GIGI you foster these habits and abilities as you help your students interpret data guided by hypotheses, propositions, arguments, or questions.

An essential element of data-based, issues-oriented inquiry is to

challenge your students by giving them opportunities to

· raise new questions,

- · question the quality of the data,
- · seek more useful or current data,
- articulate relationships they perceive,
- · explain their processes of investigation, and
- · defend their positions, decisions, and solutions.

Why These Issues Were Chosen

In planning GIGI, we sought timeless issues that are truly global in scope and that are of special concern to geographers. In this way, GIGI fosters what the National Geography Standards calls "the geographically informed person" needed by modern global citizenry (Geography Education Standards Project 1994).

The major case study, chosen to give solid grounding to the issue, is focused on a region where the issue is clearly expressed. The secondary case studies, based in other regions including the United

States and Canada, show the *global* scope of the issue.

It is important to stress that, although GIGI contains a wide selection of case studies in all major regions (Figure 1) as well as frequent references to the global distribution of many geographic phenomena, GIGI is not a traditional regional geography. It does not attempt to provide basic geographic information for each region, such as one finds in traditional regional geography textbooks. In teaching a GIGI module, it is important to keep the emphasis on the issue and not get distracted with extraneous regional information.

Role of Questions

Each GIGI module is divided into six to eight lessons, each titled by a question; subquestions head individual sections of the lessons. Questions guide inquiry in order to merge the process of investigation with the drawing of conclusions. Directly linking questions and answers helps achieve an intellectually satisfying understanding of a problem (Slater 1993). When students are asked to learn only conclusions without learning how they are drawn, we perpetuate the tradition of an answer-centered education bereft of higher-level thinking. Therefore, it is important that students understand they are not

always expected to answer the questions when they first appear, but rather to keep them in mind as guides when they are reading or discussing.

GIGI asks both convergent and divergent questions, trying to reach a balance between the two. Supplement the questions in GIGI by asking your students many more of the types of questions suggested by Slater (1993). These are questions that encourage

- · recall.
- · classification and ordering,
- · the use of data to draw conclusions,
- awareness of the limitations of data or of evaluation of data, and
- · awareness of the processes of reasoning used.

According to the National Geography Standards, the "geographically informed person applies a comprehensive spatial view of the world to life situations" (Geography Education Standards Project 1994). In order to foster such a view of the world, GIGI asks geographic questions that ask where things are and why. By asking such geographic questions and by having students learn to ask them, you will reinforce GIGI's approach. A good question to begin with is: Where is this issue located? Then proceed to questions such as the following:

- · Why does it take place there?
- · How and why does this issue affect the people in this place?
- In what other places do people confront this issue?
- · How and why are these places related?
- What alternatives do people have to improve their situation, and which alternatives do you recommend?

Fundamental Themes of Geography

In recent years, many geography teachers have learned that the five "fundamental themes" (Joint Committee on Geographic Education 1984) help them ask geographic questions. The theme of Location asks where things are and why things are located where they are. Place is the theme that inquires into human and physical characteristics of locations. Human-Environment Interaction examines how and why humans both adapt to and modify their environments as well as the consequences of these actions. Movement investigates not only how and why places are connected but also what is the significance of those interactions. The theme of Region seeks to identify and explain similarities and differences among areas and how and why these form and change. An extended explanation of the themes and their concepts, interrelationships, and applications is

given in Hill and McCormick (1989). The themes are useful because they encourage the kinds of questions required to help students develop the geographic perspective.

Importance of Local Examples

GIGI is a world geography, but it shows that issues work at various geographic scales—personal, local, regional, national, and global. Because it is sometimes difficult for younger students to identify with faraway places, success with GIGI in part depends upon the ability of both you and your students to relate the issues to examples in your local community. We strongly recommend that you refer in class to local examples of the issue being investigated. Just as important, we encourage you to have your students conduct local field studies related to this issue whenever possible. Issues having important geographic dimensions abound in every community (see the Extension Activities and Resources section at the end of this Teacher's Guide for examples). Peak educational experiences often come when students see things in the field that relate to their classroom studies. We discuss other reasons for local involvement in the next section.

Familiar people can be as important as familiar places in motivating students. The quality of personal engagement is at the crux of successful instruction. Using the BGGS videodisc segments that accompany most GIGI lessons is a powerful way to help your students find relevance by identifying the GIGI issues with real people. Similarly, you can connect GIGI issues to everyday life at a human scale, especially at the students' own age levels, by using current newspaper accounts or magazines that address the student's perspective.

As you gain familiarity with teaching local examples, as you develop field exercises for your students, and as you learn how to put a human face on these materials, you will begin to customize the GIGI modules to fit your particular environment. Our trial teachers reported that the more they taught GIGI modules, the more comfortable they became in adapting them to fit their needs.

Fostering Optimistic and Constructive Perspectives

The seriousness and complexity of the global issues studied in GIGI can overwhelm students unless you take care to foster optimistic and constructive perspectives toward issues. "Gloom and doom" needs to be balanced with examples of success and prospects for positive change. It is important to help your students develop a

sense of personal efficacy, an attitude that their actions can make a difference in solving global problems. The maxim, "Think Globally, Act Locally," speaks to the need to help students organize and conduct constructive actions that address local variants of the issues they are studying. As we noted earlier, student involvement in local projects enriches their educational experience. There is also good evidence that it actually produces an optimistic feeling—that their actions *can* make a difference—to help them deal with the often difficult and sometimes depressing world issues. GIGI modules often include lessons and activities to show possibilities for positive action.

Certain perspectives foster student optimism and constructive behavior. Geography students, especially, should learn to respect other peoples and lands, and they should come to cherish environmental unity and natural diversity. They should also learn to be skeptical about simplistic explanations, such as the theory that attempts to explain human characteristics and actions in terms of the physical environment alone, which geographers call "environmental determinism." Most important, optimistic and constructive perspectives accompany the development of empathy, tolerance, and openmindedness. These traits are fostered by avoiding sexist and racist language, discouraging ethnocentricity, and challenging stereotypes, simplistic solutions, and basic assumptions.

References to Data

Unlike most textbooks, GIGI attributes its sources of data with in-text citations and full reference lists, which is another way of encouraging the critical perspective. In the Student DataBook, material that has been extracted from original sources is indented and printed in a different typeface. Long extracts are highlighted with background color. Use of these sources helps your students learn that real people construct ideas and data and that their concepts and information are not immutable. Instead, they often change through the critiques and interpretations of various people. By using these scholarly conventions, we intend to encourage your students to appreciate the tentativeness of knowledge and to value scholarship and academic integrity.

Updating

Real data quickly become obsolete. GIGI addresses this fact by discussing historical trends of data and by stressing concepts. You should reinforce this bias for concepts and also freely acknowledge the datedness of information by explaining why it is still used (for example, the lags between research and writing and publication and

use; the lack of more recent data). Whenever possible, guide students to update materials. Britannica's Geopedia, on the BGGS CD-ROM, contains data based on Encyclopædia Britannica's World Data Annual, which is also available in print form. Have students use these sources to supplement and update GIGI data.

Assessing Learning

Evaluation of student achievements with GIGI can be focused on two broad areas. The first is the developing ability of students to undertake geographic inquiry. The second is the acquisition of knowledge and perspectives about the module issue.

The ability of students to undertake inquiry in geography can be related to the primary questions that guide geographical study. They are noted earlier in this memo. As students work through the module, they are likely to become increasingly adept at asking and answering geographic questions. Seek to extend your students' competence in several clusters of skills that facilitate geographic inquiry. These clusters include the following:

- Identifying problems and issues. This may be done through observation, asking questions, brainstorming, reading, and in other ways.
- Inquiring into the problems and issues in many ways such as through map reading and interpretation, making surveys, and using results of surveys done by others.
- Making decisions and taking action, for example, through reviewing alternatives, establishing priorities and criteria, and communicating cooperatively with people in other ways.
- Reflecting at all stages of the process of inquiry, especially through careful consideration of diverse sources of evidence.

Students will acquire knowledge of the module issue as they make their inquiries. This knowledge can be tested and graded. Assessments may be based on the following:

- Knowledge and skills shown by work on Activities included in this Teacher's Guide and on questions in the Student DataBook.
- Observations of student participation in groups and in class discussions.

Specific assessment ideas are given at the end of some lessons in the section called For Further Inquiry. In addition, the Teacher's Guide ends with Extension Activities and Resources. Some of these extension activities can serve as authentic assessments.

Potential Uses

In addition to the flexibility offered by the free-standing nature of the modules, GIGI has a number of other characteristics that encourage widespread use. Modules can be extended and enhanced with the BGGS CD-ROM, videodiscs, and posters. Because GIGI's issuesbased approach integrates several topics (for example, population, economic, political, physical, and cultural geography) in a single module, the modules are not conducive to using an approach in which topics are taught separately. On the other hand, GIGI may be used with a world regional approach because there are modules for each of 10 world regions. A year-long world geography or global studies course will have more than enough material by using 12 modules. Five to seven modules may constitute a one-semester, issuesbased geography course covering several regions. You can define clusters of modules for your own curricular purposes. We have identified three clusters for interdisciplinary studies within the Britannica Global Geography System, each comprising six or seven GIGI modules. They are Earth's Environment and Society, Economic Development, and Global Political and Cultural Change. BGGS includes a videodisc and poster for each cluster. These strand packages could well be used in Social and Environmental Studies, Earth Science, Global Studies, and Area Studies classes. Activities in the modules also support math, language arts, and arts curricula.

GIGI encourages and facilitates the development of a variety of geographic skills that transfer widely into the natural and social sciences. Among these are skills of asking geographic questions and developing and testing geographic generalizations. These require other GIGI skills including examining and making a variety of maps; analyzing photographs; constructing and interpreting graphs and tables of spatial data; and collecting, interpreting, and presenting geographic information.

Finally, GIGI promotes a wide variety of linguistic, numeric, oral, creative, and social skills as well as geographic skills. In particular, GIGI emphasizes cooperative learning. We believe that one of the great strengths of the GIGI modules is that they give students practice in both group and individual problem solving. As students become more familiar with the global issues, they learn that finding solutions to world problems requires people to work together cooperatively.

References

Geography Education Standards Project. 1994. Geography for Life: The National Geography Standards. Washington, DC: Geography Education Standards Project.

- Hill, A. David, and McCormick, Regina. 1989. Geography: A Resource Book for Secondary Schools. Santa Barbara, CA: ABC-Clio, Inc.
- Joint Committee on Geographic Education. 1984. Guidelines for Geographic Education: Elementary and Secondary Schools. Washington, DC:
 Association of American Geographers and National Council for Geographic Education.
- Slater, Frances. 1993. Learning through Geography. Revised. Indiana, PA: National Council for Geographic Education.

PREPARING TO TEACH THIS MODULE

Development

How does development affect peoples and places?

In this module, students inquire into the problems of development. They learn that development is a complex process involving economic, political, social, and environmental dimensions. Development brings improvements in standards of living, but it also stresses local cultures and physical environments. Development links local, regional, national, and global forces. Many local and global concerns and conflicts today are tied to the fact that development—within and between nations—is uneven. Development needs to be an important part of the curriculum because the developing world, which is often referred to as the "Third World," is rapidly demanding the attention of the developed, industrialized world.

This module helps students understand development from a geographic perspective. All of the five themes of geography—Location, Place, Human-Environment Interaction, Movement, and Region—are employed in this study. Students learn to locate developed and developing countries and the regional patterns of global development. Also, the module asks students to identify the physical and human characteristics of developing places and to acknowledge that the human and physical systems must be considered together in the development process. Finally, students discover the importance of spatial linkages in technology, trade, and financing to development.

The first lesson introduces the concept of development and alternative paths to development. In Lesson 2, students examine the nature of the Amazon region, the locale of this module's major case study. It is this region's physical environment, including its natural resources, that make it both a challenge and an attraction to developers. Lesson 3 sets out the forces that are driving development in the region: Students learn not only about the kinds of development activities but also about the way in which international connections affect development. The subject of Lesson 4, the problematic issue of the

survival of indigenous peoples in the face of Amazonian development, challenges students to think of parallels with Native Americans in North America. The major case study concludes with Lesson 5, in which students are asked to make decisions about a proposed development project.

Lesson 6 is a comparative case study of development in Eastern Europe under the communists, where central planning and the absence of political dissent created rapid industrialization with serious environmental repercussions. Lesson 7 concludes the module with a brief look at one of the world's most famous regional development efforts, the Tennessee Valley Authority in the United States. Students learn why the TVA has been used as a model for development projects in many parts of the world.

Using the BGGS CD-ROM can simplify lesson planning by making it easy to access the resources the system provides for each lesson. It shows exactly which Geopedia™ data and learning activities can be used in long-range and short-term assignments, and which videodisc clips will provide visual reinforcement for each GIGI lesson. The CD-ROM can also show you ways in which a lesson in one module relates to a lesson in another module. And it indicates where to find every reference in GIGI, Geopedia™, the Mini-Atlas maps, and the videodiscs to any key topic—for example, "tsunami" or "Bangladesh." The students will also be able to use the BGGS CD-ROM for further research and short-term or long-term range assignments. The BGGS multimedia components and their uses are explained fully in the tabbed BGGS section in the front of this Teacher's Guide.

The following are general modifications recommended for younger students:

- Plan for fifteen days because the activities will require more teacher explanation and support.
- Provide directions for homework assignments and monitor students' understanding and progress.
- Prior to assigning written activities requiring students to draw conclusions and summarize their findings, ask guiding questions and develop a sample outline on the chalkboard.

Number of Days Required to Teach Development

Twelve to sixteen 50-minute class periods

Suggestions for Teacher Reading

Goulet, Denis. 1973. The Cruel Choice: A New Concept in the Theory of Development. New York: Atheneum.

- Head, Suzanne, and Heinzman, Robert, editors. 1990. Lessons of the Rainforest. San Francisco: Sierra Club Books.
- Hecht, Susanna, and Cockburn, Alexander. 1990. Fate of the Forest: Developers, Destroyers, and Defenders of the Amazon. New York: Harper Collins Publishers.
- Kane, Joe. 1993. With spears from all sides: letter from the Amazon. *The New Yorker*, September 27, pages 54–79.



What is development?



Time Required

Two to three 50-minute class periods



Materials Needed

Copies of Activity 1 for all students Transparency of Overhead 1 Transparency of Overhead 2 Pieces of candy, fruit, or nuts Mini-Atlas map 1



Glossary Words

development gross national product (GNP) oligarchy

Getting Started

- Have students read the Memo to the Student and the overview on pages 2-3 in the Student DataBook prior to beginning the module. Also make students aware that there is a Glossary in the back of their DataBooks.
- Play the Shares Game to help students experience the difference between developed and developing countries. Have the class count off in fours. All students with the number 1 represent the United States, students with the number 2 represent Poland, those with the number 3 represent Nicaragua, and those with the number 4 represent Ethiopia. Form groups of four students so that each group has a repre-

sentative from each of these four countries. Tell students that the four countries represent a continuum of countries that range from very rich to very poor.

Give each student a number of shares according to the country they represent. The shares stand for GNP per person (represented by pieces of candy, fruit, or nuts), average life expectancy (represented by minutes of playing time), and availability of resources (represented by resource points). Write the following distribution of shares on the chalkboard:

Country	GNP per person (pieces)	Life expectancy (minutes)	Resource availability (points)
United States	18	6	584
Poland	9	5	120
Nicaragua	4	4	22
Ethiopia	1	3	1

The point of the game is for students to beg, borrow, or negotiate resource points for pieces of candy, fruit, or nuts. Announce the start of the game and keep time. Students must drop out when 3, 4, 5, or 6 minutes of time expire (the game lasts only 6 minutes). Then have students discuss their feelings about the distribution of shares or other matters about the game.

Procedures

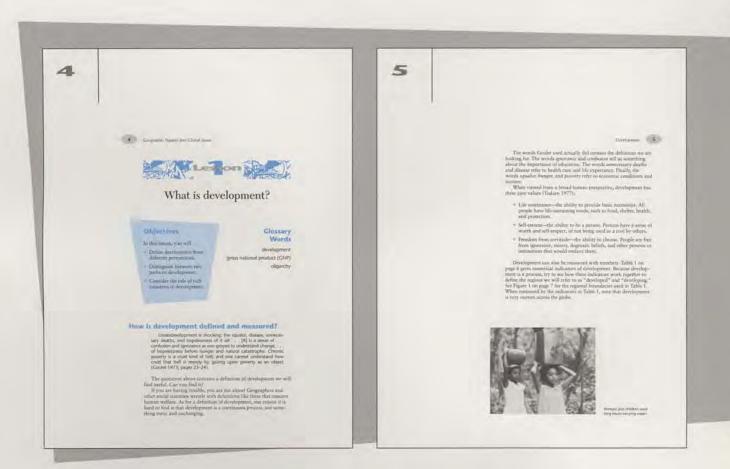
How is development defined and measured? (pages 4–7)

- A. Form small groups and have students read this section, including Questions 1–6 on page 6, but have them wait to answer the questions.
 - Younger students may have difficulty with some of the vocabulary and concepts in the reading, so you may want to have them read the section aloud so you can help them.
- B. Direct students' attention to Table 1 on page 6 and Figure 1 on page 7. Have them look carefully at each of the 11 regions shown on Figure 1 so that they develop good mental maps of the regions given in Table 1. Have students use Mini-Atlas map 1 along with Figure 1 to help them identify the major countries in these 11 world regions.

- C. Hand out copies of Activity 1 to individual students or to pairs of students and give these instructions:
 - a. On Activity 1, make a choropleth (areavalue) map of GNP per person using the data from Table 1. Use these four categories for mapping the data for each region:
 - Less than \$1,000
 - \$1,000 \$3,999
 - \$4,000 \$9,999
 - \$10,000 and over

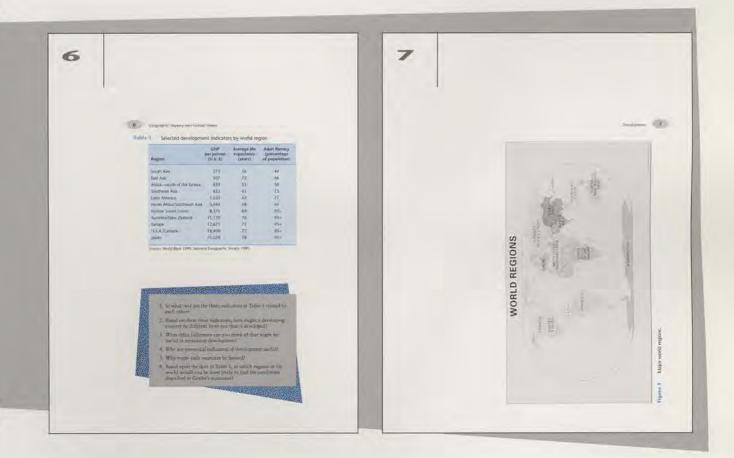
Challenge older students to make their own categorizations and develop their own symbols and legend for this map.

b. Use colors or black and white symbols to show the four categories. Use light colors or open, light symbols to show regions



- with low values and stronger, darker colors or symbols to show regions with high values. Add a legend and a title to the map. See the *Key for Activity 1* on Overhead 1.
- c. Have students use Activity 1 to classify the regions as either developed or developing. Classify all regions with over \$10,000 GNP per person as developed, but note that this is an arbitrary designation based on the way the data are given. Encourage students to express their images of the differences between developed and developing countries in terms of wealth, literacy, and life expectancy.

Have students compare their maps with the completed map on Overhead 1 (*Key* for Activity 1). D. Have students work in pairs to answer Questions 1-6 on page 6. To give students a hands-on experience with the relationships mentioned in Question 1, you may wish to have students make scatter diagrams with the data in Table 1. Scatter diagrams are made by plotting two factors. For example, South Asia's level of development is represented by a point on the graph when its life expectancy number is plotted against its GNP per person. A scatter diagram can also be made for the other twofactor combination: literacy and GNP per person. The points for each developing and developed region will form a cluster and suggest a trend of increasing literacy and life expectancy as GNP increases. You may wish to use Overhead 2 to show students these two scatter diagrams.



Questions and Answers for page 6

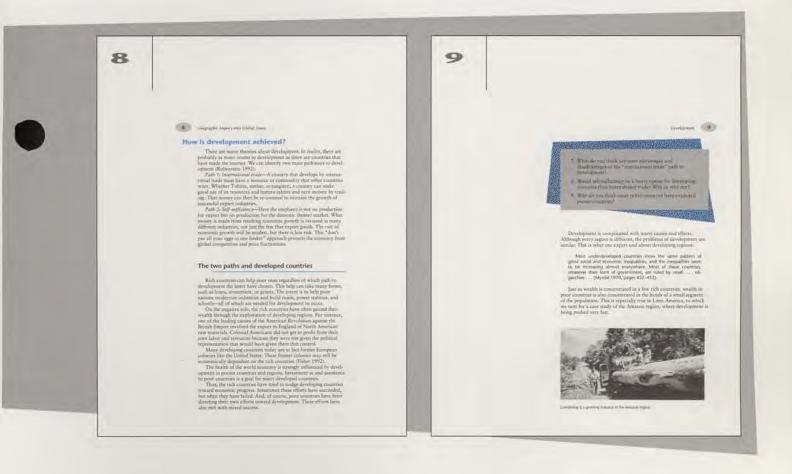
- 1. In what way are the three indicators in Table 1 related to each other?
 - They are directly related. The same regions have the lowest values on all three indicators, and other regions have the highest values. To check for understanding, you might ask whether these same relationships also apply in the United States: Are wealth, literacy, and life expectancy related in our own population?
- 2. Based on these three indicators, how might a developing country be different from one that is developed?
 - This can be answered in a number of ways. The purpose of the question is to have students try to articulate their conceptions of development.
- 3. What other indicators can you think of that might be useful in measuring development?
 - Students might mention birth and death rates, availability of physicians, educational
 attainments, energy consumption, level of urbanization, or other social, demographic, and
 economic indicators.
- 4. Why are numerical indicators of development useful?
 - Numerical indicators provide ready comparisons between countries. Although it is a crude measure, GNP per person is the most commonly used indicator in comparing countries on their levels of development.
- 5. Why might such measures be limited?
 - Numerical measures are sometimes only crude estimates, especially for developing countries that do not have the technical resources to collect accurate statistics.
 - Another limitation of national-level statistics, such as GNP per person, is that they often mask wide regional differences within countries. The major problem is that development is a complex, multidimensional process, which cannot be captured with narrow numerical measures. To make this point, ask students to discuss the problem of measuring the "three core values" identified by Todaro (Student DataBook on page 5).
- 6. Based upon the data in Table 1, in which regions of the world would you be most likely to find the conditions described in Goulet's statement?
 - Table 1 shows that the four poorest regions are South Asia, East Asia, Africa—south of the Sahara, and Southeast Asia.

How is development achieved? (pages 8-9)

E. Have students read the remaining material in the lesson. You may wish to have them continue to work in pairs to answer Questions 7–9 on page 9. These are difficult questions that call for student opinion and rely to some extent on prior knowledge. Students should support their opinions with reasonable arguments. Alternatively, you might structure a

debate in which students are asked to address those questions. The debate might be based on the following premise: Resolved: Countries that follow the international trade path to development will be more successful than those that follow the self-sufficiency path.

You may wish to skip Questions 7–9 with younger students.



Questions and Answers for page 9

- 7. What do you think are some advantages and disadvantages of the "international trade" path to development?
 - Theoretically, trade based upon comparative advantage (the principle that areas produce those items for which they have the greatest advantage over other areas, as long as free trade exists) promotes the welfare of each trade partner because each relies on comparative strengths. The partners have complementary resources. A possible disadvantage is that trade is not always fair and free because some countries have many more resources than others. Quickly exhausted (nonrenewable) resources have obvious limitations that may hinder long-term development through international trade. Countries that take this route would be advised to take some of the profits and diversify and create new, sustainable industries as available resources are exploited.
- 8. Would self-sufficiency be a better option for developing countries than international trade? Why or why not?
 - This is an opinion question. Students may note that this path protects the economy from global competition and price fluctuations. But self-sufficiency implies isolation from the global economy, which usually means that only a narrow range of local goods and services is available.
 - Self-sufficiency makes more sense for a resource-rich country than one that is resource-poor. Self-sufficiency may protect a country from foreign control of its resources.
- 9. Why do you think some richer countries have exploited poorer countries?
 - Under colonialism, rich countries reached out to acquire the raw materials and/or the cheap labor of poorer countries to further their own development. Some of the development in Europe and North America has been built with cheap materials and/or labor from poor countries.

For Further Inquiry

Ask students to write a paragraph describing and explaining their maps on Activity 1 and using the terms *GNP per person*, development, developed countries, and developing countries.



What is the Amazon environment like?



Time Required

Two 50-minute class periods



Materials Needed

Mini-Atlas map 2 Copies of Activity 2 for all students Transparency of Overhead 3 Red and blue pens or pencils

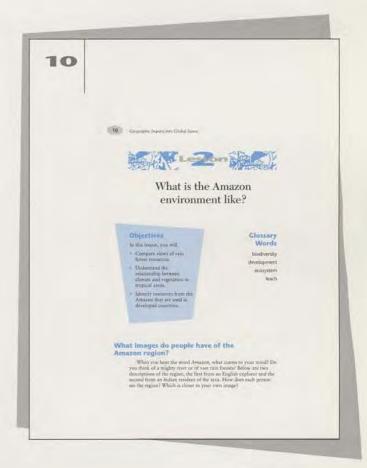


Glossary Words

biodiversity development ecosystem leach

Getting Started

Ask students to share their images of the Amazon region. You might choose to play a word association game. Have each student say a word that promotes an image of this region. Post the words and discuss them, perhaps asking: Which words do you all agree on? Which words surprised you? Where do you think your word associations came from?



Procedures

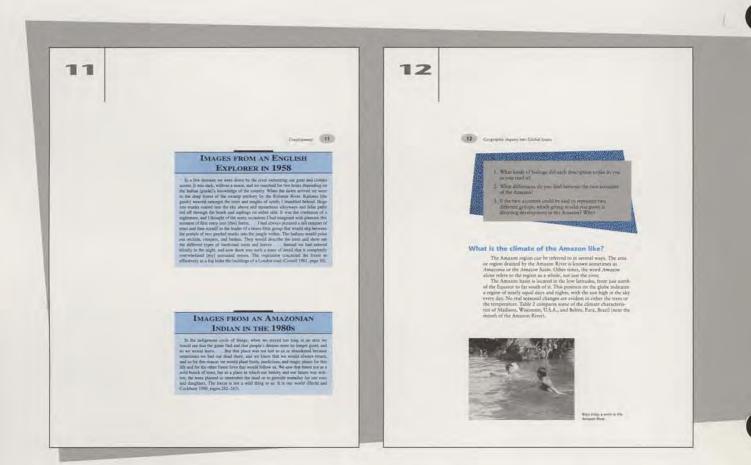
What images do people have of the Amazon region? (pages 10–12)

A. Have students read the opening paragraph on page 10 in the Student DataBook. Then, working in pairs, have each pair read one of the two readings on page 11. When both students have completed their readings, have them tell each other about what they read and then discuss their responses to Questions 1–3 on page 12. You may or may not choose to have them write out their responses to these opinion questions.

Questions and Answers for page 12

- 1. What kinds of feelings did each description evoke in you as you read it?
 - · Responses will vary from student to student.
- 2. What differences do you find between the two accounts of the Amazon?
 - Responses will vary from student to student. One account is by an outsider—a stranger to the region—and the other is by an insider—an Indian.

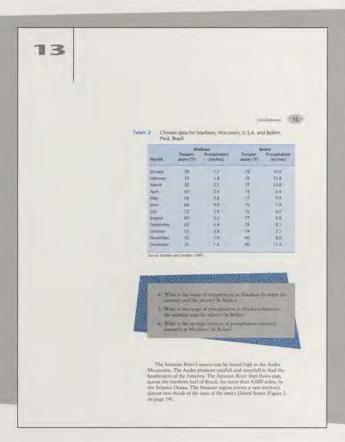
continued

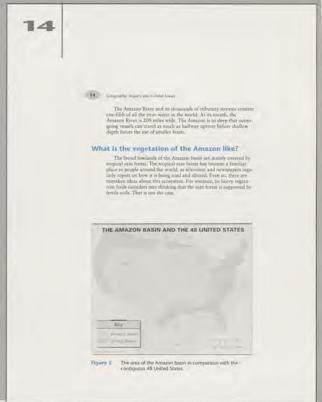


- 3. If the two accounts could be said to represent two different groups, which group would you guess is directing development in the Amazon? Why?
 - Students are likely to surmise that the outsiders are directing development in the Amazon
 because they view the region with a fear of the unknown. Outsiders are more likely to see
 the region as a reservoir of resources that can be extracted for profit. The indigenous
 people, on the other hand, perceive the forest as their entire world. They want to preserve
 it rather than change it.

What is the climate of the Amazon like? (pages 12–14)

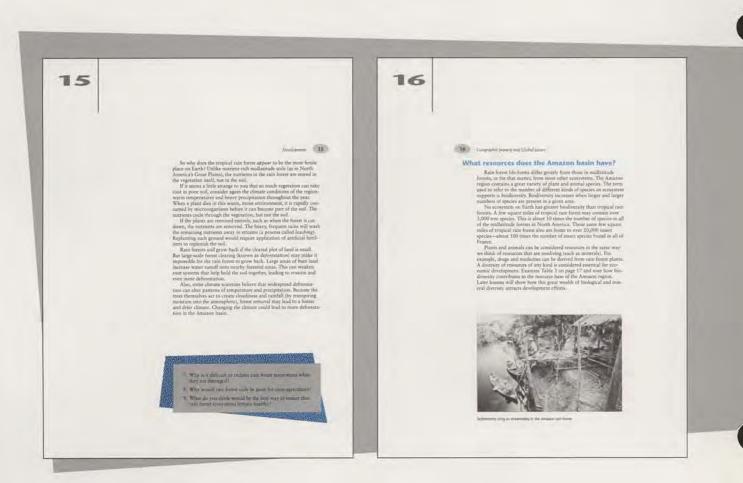
- B. The reading in this section, including Figure 2 on page 14, gives students a sense of the size of the Amazon River and of the entire Amazon basin in comparison with the United States. Help students understand that a river basin includes all the area drained by a river and its tributaries. Have students use Mini-Atlas map 2 to identify the countries that have territory in the Amazon basin. [Brazil, Colombia, Ecuador, Peru, and Bolivia]
- C. Give each student a copy of Activity 2 and a red and blue pencil. Have students continue to work in pairs to complete Activity 2. One student in the pair can make the climograph for Madison and the other can do the one for Belém. Encourage them to help each other and to work together to answer the two questions on the Activity as well as Questions 4–6 on page 13 in the Student DataBook. Project Overhead 3 (the Key for Activity 2) so that students can compare their climographs and answers with those on the Key.





Questions and Answers for page 13

- 4. What is the range of temperature in Madison between the summer and the winter? In Belém?
 - The temperature range in Madison is 54°F (July 72°F–January 18°F). The range in Belém is only 4°F (November/December 80°F–June/July 76°F). Generally, temperature range increases with latitude. (Note that Belém is slightly south of the equator, so its seasons are reversed from Madison's.)
- 5. What is the range of precipitation in Madison between the summer and the winter? In Belém?
 - The range of precipitation in Madison is 2.3 inches (June 4.0 in.–January 1.7 in.). The range in Belém is 7.2 inches (March 12.0 in.–August 4.8 in.). Note that although the summer is the wettest season for both places, the seasonal difference is marked most by temperature in Madison and most by rainfall in Belém.
- 6. What is the average amount of precipitation received annually in Madison? In Belém?
 - The average in Madison is 33.3 inches; in Belém it is 105.1 inches.



What is the vegetation of the Amazon like? (page 14)

D. Continuing their work in pairs, have students read this section and answer Questions 7-9 on page 15. Encourage students to help each other understand the tropical rain forest ecosystem.

Younger students may need extra time and guidance with the concepts in this section.

Questions and Answers for page 15

- 7. Why is it difficult to reclaim rain forest ecosystems when they are damaged?
 - Widespread deforestation is difficult to reverse because of soil erosion, the loss of nutrients (all contained in the lost vegetation) needed to grow plants, and the loss of seed sources needed for revegetation.
- 8. Why would rain forest soils be poor for crop agriculture?
 - Most of the nutrients required for crop growth are contained in the vegetation rather than
 in the soil. When the vegetation is removed, the nutrients are removed. What little
 nutrients that are in the soil are quickly removed by leaching from heavy rains. Supplying
 crops with adequate nutrients would require heavy use of fertilizers.
- 9. What do you think would be the best way to ensure that rain forest ecosystems remain healthy?
 - Students may recognize that the health of rain forest ecosystems depends upon the degree of disturbance or deforestation. The ecosystem can tolerate a small amount of disturbance, e.g., small-scale forest clearing, but not a large amount.

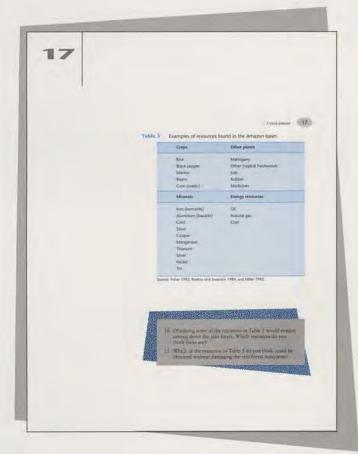
What resources does the Amazon basin have? (pages 16–17)

E. Have students continue to work in pairs. They need to read this section in the Student DataBook and help each other understand the

concept of biodiversity as well as the concept that biodiversity is an important resource. Conclude the lesson by answering Questions 10 and 11 on page 17.

Questions and Answers for page 17

- 10. Obtaining some of the resources in Table 3 would require cutting down the rain forest. Which resources do you think these are?
 - Some parts of the rain forest would have to be cut down to grow crops, mine metals, dig
 coal, and pump oil and gas. Also, because of the great species diversity, it is very difficult
 to cut mahogany and other valuable hardwood trees on a large scale without destroying
 other kinds of trees.
- 11. Which of the resources in Table 3 do you think could be obtained without damaging the rain forest ecosystem?
 - Without prior knowledge, students will have difficulty with this question, but encourage speculation. Tapping natural rubber trees and collecting medicinal plants on a small scale does not damage the rain forest ecosystem. This idea is fully developed in the later lessons.



For Further Inquiry

Encourage students to bring in news articles for a bulletin board about deforestation and about resource uses of tropical rain forests.



What forces are driving development in the Amazon?



Time Required

Two to three 50-minute class periods



Materials Needed

Transparency of Overhead 4 Butcher or poster paper Mini-Atlas map 3



G Glossary Words

developed country developing country development petty extraction sustainable agriculture

Getting Started

Have students bring examples of tropical rain forest products to class. They might bring in something made from a tropical hardwood or rubber tree, a nut, a flavoring or spice, etc. Ask students to speculate about how the object might have been collected or harvested and speculate about where the raw material might have been shipped for processing or manufacturing.



Procedures

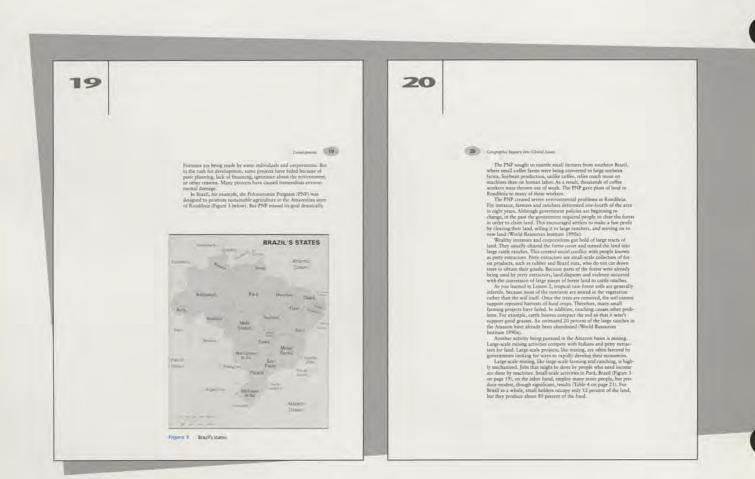
Who has sought to profit from the Amazon? (pages 18–21)

A. Put students into groups of four or five. Have each group write a skit based upon these pages. Skits can depict the Polonoroeste Program (PNP) and its conflicts among farmers, miners, ranchers, petty extractors, and loggers. Groups can address Questions 1–3 on page 21 in their skits, or you can use the questions to guide a follow-up class discussion. Have each group perform its skit for the rest of the class. If you wish, the class can vote on the best skit and/or you can give prizes as you see fit.

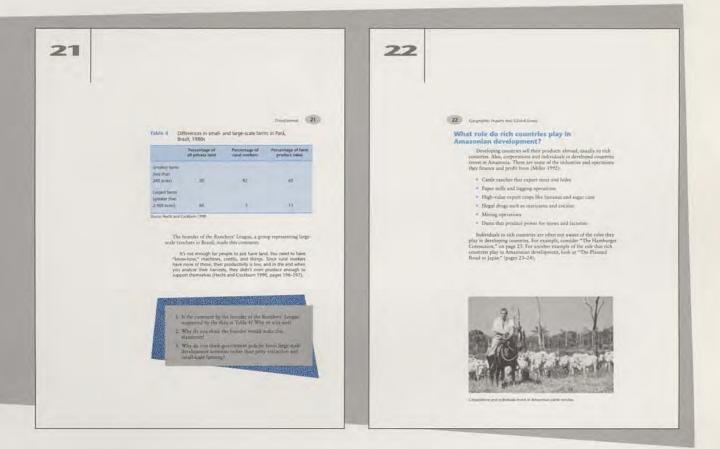
Questions and Answers for page 21

- 1. Is the comment by the founder of the Ranchers' League supported by the data in Table 4? Why or why not?
 - No, the data in Table 4 specify that with only 20 percent of the land the smallest farms
 have 65 percent of farm product value, while with 60 percent of the land the largest farms
 produce only 13 percent of farm product value. This is good evidence that small
 landholders are more productive than are large landholders.

continued



- 2. Why do you think the founder would make this statement?
 - He would make this statement in order to persuade the government to support the members of the Ranchers' League in their land disputes against small landholders.
- 3. Why do you think government policies favor large-scale development activities rather than petty extraction and small-scale farming?
 - Students may have insufficient prior knowledge to answer this, but encourage speculation. Reasons include the following: Some large-scale activities, like logging and mining, produce immediate economic returns. Large-scale activities also look good to planners and lending agencies. If environmental costs are not figured into the projections, profits look very good. Small-scale activities are relatively invisible. They do less damage but produce smaller returns; they don't look impressive on paper. People who engage in small-scale economic activities historically have had very little political power, so they don't have much influence on government policies.



What role do rich countries play in Amazonian development? (pages 22-24)

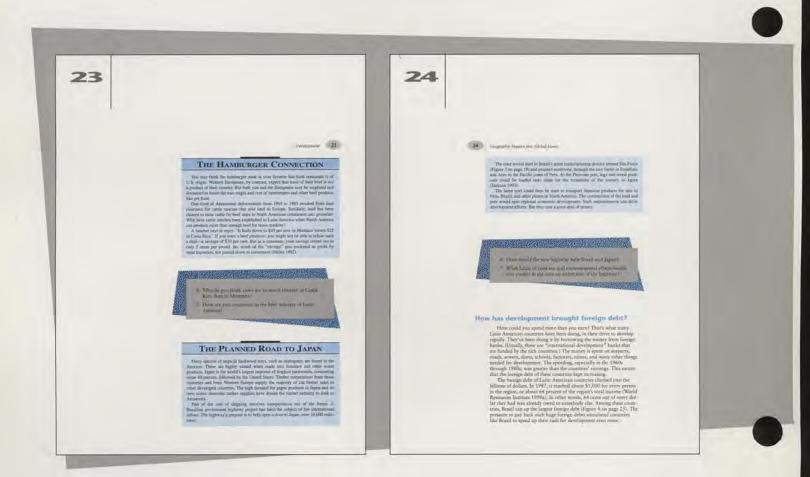
B. This section is about global connections. It highlights trade between developed and developing countries and shows how demand in developed countries affects what goes on in developing countries.

Students can continue working in small groups. Provide each group with Mini-Atlas map 3, which can help students visualize the advantage of shipping to Japan from the west coast of South America compared to shipping from the east coast. (Mini-Atlas map 1 may also be helpful.)

Have half of the groups make sketches illustrating their ideas about Questions 4 and 5

on page 23—these sketches will show how the global connections work in the beef industry. Have the other half of the groups make their sketches about Questions 6 and 7 on page 24—these deal with the timber industry and its global connections. Groups can post their sketches and explain them to the class. If you wish, students can vote for the sketches they like the best and say why they like them.

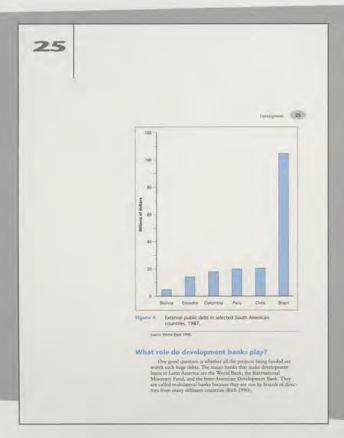
You can check for understanding with the following answers to these questions. Guide discussion so that students come to understand this general point: Choices made by people in developing countries influence decision making about development in poor countries.

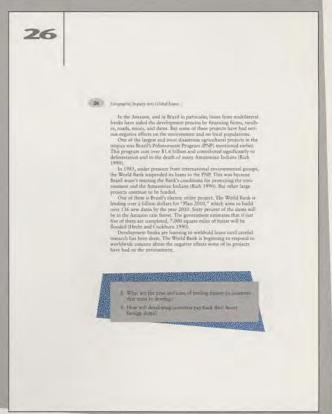


Questions and Answers for pages 23 and 24

- 4. Why do you think cows are so much cheaper in Costa Rica than in Montana?
 - Students might guess that the resources needed to produce cattle such as pasture land, supplementary feed, and labor are more expensive in Montana than in Costa Rica.
- 5. How are you connected to the beef industry in Latin America?
 - Students may recognize that as consumers of beef, whether for human use or for pet food, they are connected to the beef industry in Latin America. Also, since leather is a byproduct of the beef industry, their use of leather in shoes and clothing is a further connection.
- 6. How would the new highway help Brazil and Japan?
 - Brazil would be able to export its products to Japan and other Pacific Rim countries from
 the west coast of South America rather than from the much more distant Brazilian ports
 on the east coast. Such a cut in transportation costs would make Brazilian products
 cheaper and thus more competitive in sales to Japan and other Pacific Rim countries.

continued





- 7. What kinds of land use and environmental effects would you predict in the area on either side of the highway?
 - Encourage speculation. In general, new roads tend to promote large-scale, rather than small-scale, development. In the history of development along roads penetrating the Amazon region, highways have attracted land-hungry farmers who cleared the forest. Larger-scale uses have typically replaced the small-scale cultivators. For example, large-scale ranchers have usually followed the farmers, buying up the cleared lands for cattle grazing and further encroaching on the forest. Prospectors and miners have also moved into the areas opened up by the highway. It is likely that this history would be repeated. These uses would cause further deforestation as well as degradation of soils and water.

How has development brought foreign debt? (pages 24–25)

What role do development banks play? (pages 25–26)

- C. Have each group make a poster depicting relationships between developed countries, international banks, and developing countries. Groups can base their posters on the last two sections of this lesson, including their responses to Questions 8 and 9 on page 26.
 - Younger students may need help appreciating Figure 4 on page 25. The numbers of dollars are difficult to grasp, but such numbers in the billions are commonly used in the media. Emphasize the value of a billion dollars and what that might buy in the United States, such as one-half of a Space Shuttle. Developing countries view

- a billion dollars more like a student would, as an overwhelming amount, rather than a drop in the bucket of the trillion-dollar U.S. annual budget.
- D. In a concluding class discussion, compare each group's poster with Overhead 4, which depicts two scenarios: (1) the developing country is receiving good prices for its exports and is able to pay back its loans to international banks—it is handling its debt; (2) the developing country is receiving low prices for its exports and is not able to pay back its loans to international banks—its debt is increasing. Other scenarios can be shown. For example, the debt of developing countries can increase if they:
 - receive good prices for their exports, but they over-borrow;
 - get low prices for their exports and pay high prices for their imports.

Questions and Answers for page 26

- 8. What are the pros and cons of lending money to countries that want to develop?
 - A great deal of capital is required to build facilities for the industry, transportation, communication, and other necessities of development. Poor countries choosing to develop must borrow capital. If their development projects are successful and if they haven't borrowed too much, they should be able to pay back their loans. But unfortunately it hasn't worked out that way for many developing countries. In the 1970s and 1980s, for example, Brazil borrowed vast sums to pay for huge development projects. A worldwide recession reduced the market for Brazilian exports, which meant that Brazil could not earn enough to pay back its loans.

continued

A personal analogy can help younger students understand these ideas. For example, if students want to buy something that costs more than they have saved, they can either wait until they have saved enough money or they can borrow the money. If they borrow more than they can pay back, they will find themselves in a situation similar to that of many developing countries.

- 9. How will developing countries pay back their heavy foreign debts?
 - Some banks have reduced or even dismissed the debts of some developing countries. To address their heavy debts, developing countries have been forced to cut back on their spending on necessities such as transportation, communication, education, and health care, which of course slows the pace of development. They also have reduced their borrowing. But the major way that a country makes money to pay its debts is by selling its products and services at good prices, which enables it to continue to develop.

For Further Inquiry

Have students conduct a survey in neighborhood stores and meat markets to discover the origins of the meat being sold. What kinds of meat are coming from what countries? Are there relationships between origins and prices? A similar survey could be done on leather goods.



How is development threatening native cultures in the Amazon?



Time Required

Two to three 50-minute class periods



Materials Needed

None



Glossary Words

caboclos

development

ecosystem

petty extraction

Getting Started

Lead a brief discussion comparing the European settlement of the frontier in North America with the development of the Amazon. Ask students whether the European hunters, trappers, scouts, guides, and settlers of North America had counterparts in the Amazon. What was the attitude of the U.S. government toward the Native Americans?

Procedures

What is Amazonia's colonial legacy? (pages 27–29)

A. After reading this section and studying Figure 5 on page 28, students can answer, either orally or in writing, Questions 1–3 on page 29. As you conduct a discussion of students' answers,



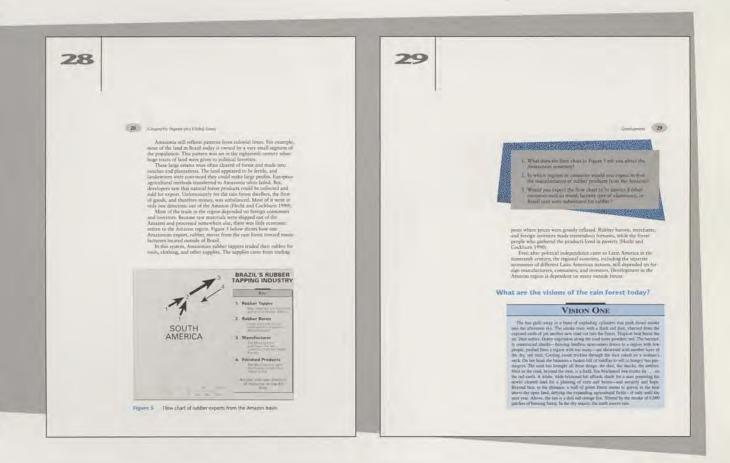
help them understand that the purpose of colonialism was to use the colonies to enrich the colonists and their mother countries. The colonies and their indigenous peoples were understood to be the property of the European rulers. For example, Indian labor and natural

resources in the Amazon region were used to create wealth for the Portuguese colonists and for Portugal. The European colonial powers, principally Spain and Portugal in Latin America, grew rich because they took resources from their Latin American colonies.

Questions and Answers for page 29

- 1. What does the flow chart in Figure 5 tell you about the Amazonian economy?
 - The Amazon's resources are being removed and exported abroad and manufactured goods from abroad are being imported.
- 2. In which regions or countries would you expect to find the manufacturers of rubber products from the Amazon?
 - Most exported raw rubber is processed into more valuable products, such as automobile tires, in industrial countries.

continued



- 3. Would you expect the flow chart to be similar if other resources such as wood, bauxite (ore of aluminum), or Brazil nuts were substituted for rubber?
 - Yes. The flow of products out of developing countries is usually in primary products such
 as those from agriculture, mining, logging, and fishing. These products move to developed
 countries where they are processed. Manufactured goods usually flow back to the
 developing countries from the industrialized nations. This exchange is often uneven—
 favoring the developed world—because manufactured goods are typically worth more
 than primary products.

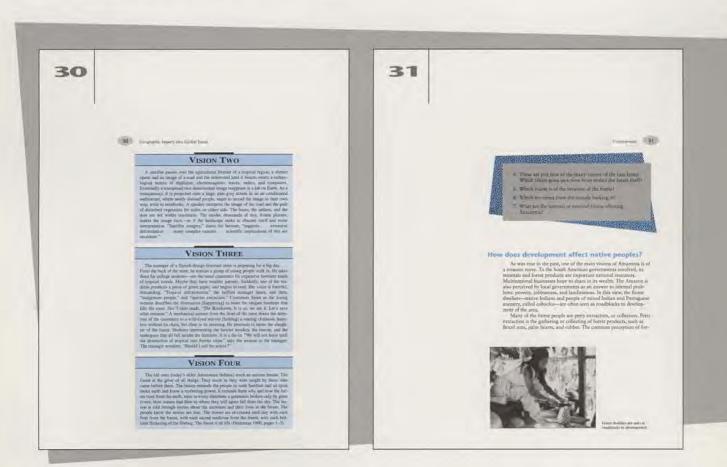
What are the visions of the rain forest today? (pages 29-31)

- B. The imagery in this section provides an opportunity to make links with literature and art. One approach is to form groups of four and divide the readings of the four visions among the students in each group. After reading their assigned visions, students can tell the others in their group what they read. In addition, have each student
 - · give a title for the vision they read, and
 - write a paragraph giving another vision, one that is not included in these four (e.g.,

from a Brazilian government official or a representative of an overseas rubber manufacturer).

Alternatively, have students make drawings of their assigned visions or the ones they create and share these on a bulletin board. Also, they can make a bulletin board by bringing in photos from magazines or newspapers that give visions of the rain forest today.

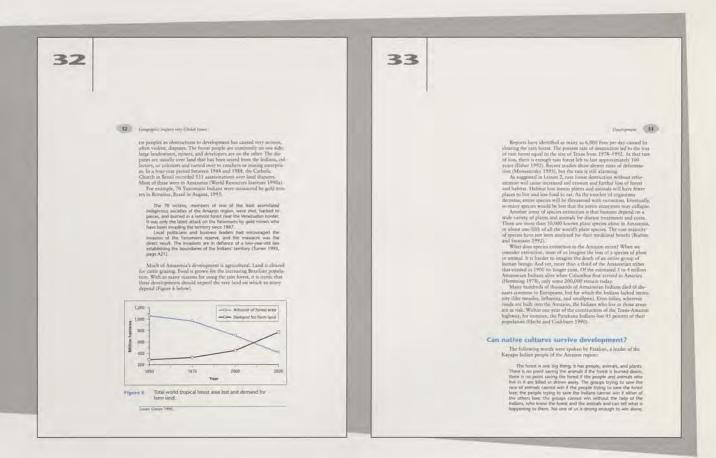
Students can share their writings and drawings within their groups or with the class. Groups can discuss their answers to Questions 4–7 on page 31.



Questions and Answers for page 31

- 4. These are just four of the many visions of the rain forest. Which vision gives us a view from within the forest itself?
 - Vision Four, the vision of the Amazonian Indian, is a vision of living in harmony within the forest. Vision One is also a vision from within, in this case a vision of damage and disharmony.
- 5. Which vision is of the invasion of the forest?
 - Vision One is a close-up view of radical change and destruction of the forest, such as would be observed by a visiting journalist, or by a colonist-farmer who has entered the burned-out forest to plant his crops.
- 6. Which are views from the outside looking in?
 - Vision Two is from an earth-orbiting satellite photographing the region from space. Vision
 Three mixes the view of a furniture dealer (probably in North America) who sells products
 made from rain forest woods, and of (college) students protesting the use of such products
 in order to save the rain forest.

continued

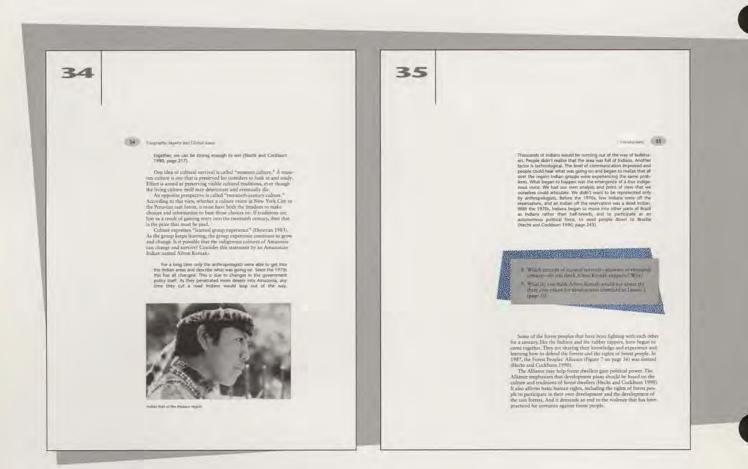


Note that distance from the rain forest affects the vision: Visions One and Four are close, small-scale, and full of intimate detail, while Visions Two and Three are from a distance, large-scale, and without detail.

- 7. What are the internal or external forces affecting Amazonia?
 - Internal private business and government interests wish to use Amazonia for development.
 Internally, there are environmental and Indian rights groups working to protect
 Amazonia's ecology and indigenous cultures from development. External forces include foreign consumers of Amazonian products and foreign investors, both of whom stimulate development, and international environmental and Indian rights groups who seek to slow or even stop development.

How does development affect native peoples? (pages 31–33)

C. Have students continue to work in their groups of four to analyze this section for bias. For example, students might say which of the four visions they believe is most represented by the text. Encourage students to support their arguments with evidence. Also, ask them to describe the vision that is promoted by Figure 6 on page 32. This graph shows that tropical forest land is being lost as the demand increases for farm land: The essential point is that tropical forest land is being converted to farm land worldwide. Ask students whether this trend can continue and if not, why not? Ask whether they think



Questions and Answers for page 35

- 8. Which concept of cultural survival—museum or twentieth century—do you think Ailton Krenak supports? Why?
 - He probably supports the concept of twentieth century cultural survival because he seems
 to speak approvingly of Indians gaining new political knowledge and power to stand up
 for themselves to protect their lands and culture, rather than depending upon
 anthropologists to preserve their culture as though it were kept static in a museum.
- 9. What do you think Ailton Krenak would say about the three core values for development identified in Lesson 1?
 - · The three core values are as follows:

Life sustenance—the ability to provide basic necessities. All people have life-sustaining needs, such as food, shelter, health, and protection.

Self-esteem—the ability to be a person. Persons have a sense of worth and self-respect, of not being used as a tool by others.

Freedom from servitude—the ability to choose. People are free from ignorance, misery, dogmatic beliefs, and other persons or institutions that would enslave them.

This question encourages student speculation and gives students practice in imagining the views of a very foreign person. Encourage discussion of these views.



Figure 6 presents a bias, and if so, what is it? [The bias here might be called the view of sustainable development, for clearly the tropical rain forest ecosystem cannot be maintained in the face of increasing loss of rain forest area. Such a trend is not sustainable.]

Can native cultures survive development? (pages 33–36)

D. Have the groups continue working together by answering Questions 8–12 on pages 35–36. This section is about power and self-determination. Although these traits are highly valued in the United States, it is ironic that Native Americans in North America have historically been denied power and self-determination. Encourage students to discuss these issues as they answer the questions. Finally, ask students what they perceive to be the bias in this section. [It is the view that development is destroying native cultures.] Have them write a rejoinder to the antidevelopment bias, perhaps listing all the reasons why Brazil should continue to develop the Amazon.

Questions and Answers for page 36

- 10. What are some of the threats that are currently facing Amazonian cultures?
 - · A partial list includes the following items:

Relocation away from the forest

Disease

Violence associated with land disputes

Adoption of values from the dominant culture

Discovery of minerals on tribal lands

Contact with a more materialistic culture

Building of dams and roads

Invasion of tribal territory by ranchers

Lack of political expertise and power

Loss of unwritten knowledge, or oral tradition

- 11. Do you think the Amazon Indians eventually will become part of the larger national cultures that surround them? Why or why not?
 - Encourage student speculation about this. Ask them whether they think there is an instructive parallel with the history of Native Americans in North America.
- 12. Do you think development is a key to Indian cultural survival, or will it doom Indian cultures to extinction? Why?
 - Again, encourage student speculation but insist that students support their opinions with facts or logical arguments.

For Further Inquiry

Have students gather information about how the European colonization and development of North America affected Native Americans. Some of the problems noted in the Amazon case study (e.g., diseases decimating entire tribes) also occurred in North America.



Is sustainable development likely in the Amazon?



Time Required

Two to three 50-minute class periods



Materials Needed

Transparency of Overhead 5 Copies of Handout 1 for all students



Glossary Words

developed country development extractive reserve seringueiros

Getting Started

This lesson offers students an opportunity to apply their knowledge of development in the Amazon in a role-play simulation. Tell students that they are going to make a land-use decision about development in the Amazon region. To do this, they will each play one of six roles in a simulation. Project Overhead 5 onto the screen and read it to the class. Procedures A through E describe the role-play.

Procedures

What is sustainable development? (pages 37–38)

Is sustainable development taking place in the Amazon? (pages 38–41)

What is the role of extractive reserves? (pages 42–43)



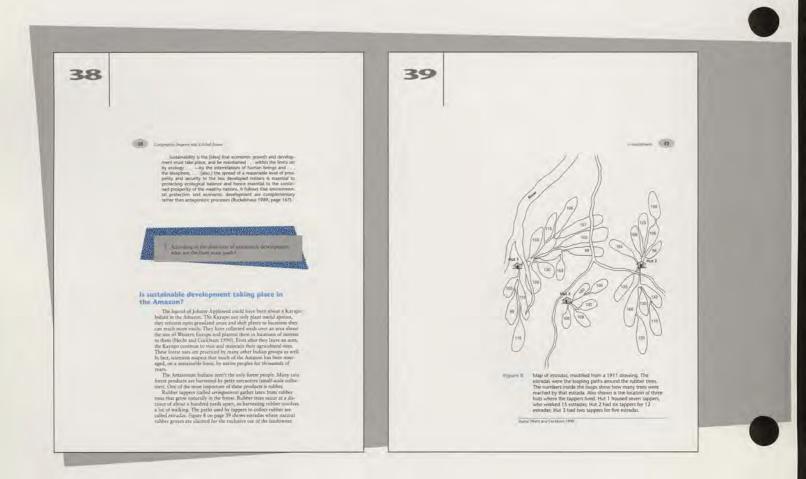
Whose rain forest is it anyway? (pages 43–45)

- A. Divide the class into six groups. Each group will take a different role. From Handout 1, give each student a copy of the role assigned to his or her group.
- B. To prepare for the hearing, have groups first discuss their roles to be sure they understand their particular interest in the proposal. Ask them to apply what they have learned from previous lessons to this initial discussion. Then, keeping a focus on their roles' special interests, have groups work through the readings and questions on pages 38–45 in the Student DataBook. This may be done in several ways: You may wish to have students write

responses to all the questions, you may assign only a few questions to different groups, or you may simply have students discuss their answers within their groups. To save time, you may wish to divide the readings among the students in each group.

It is suggested that you use Questions 5–9 on page 45 to focus a class discussion following a debriefing on the presentations. Whichever method you choose, suggested answers to Questions 1–9 are given below.

Younger students may have difficulty with several of these questions because these are speculative and require understanding of some higher-level concepts. Skip these questions if necessary.



- C. Have each group choose a representative to make a five-minute presentation for the group. These presentations will give the group's response to the proposal including the group's reasons for its particular position and any recommendations it may have. Specifically, each group will (1) say whether or not it supports the proposal to build the dam, and (2) what should be done with the people who live on the land that will be flooded if it is built, and (3) if it isn't built, how the land should be used in the future (the options are cattle ranches, extractive reserve, farming, a national park, or the present combination of traditional small-scale uses.)
- D. When you think the groups have had adequate time to prepare their presentations, begin the hearings by calling on the group representatives. Give each representative five minutes to

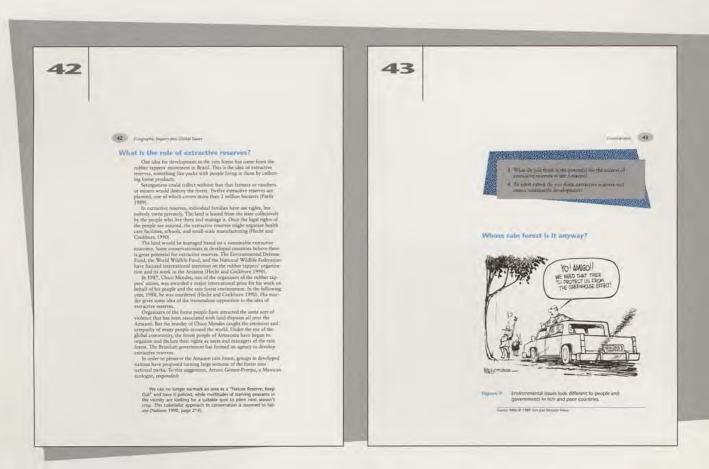
- speak. At the end of the presentations, you may wish to take votes or simply summarize the recommendations.
- E. Begin the debriefing by encouraging students to give any additional facts or opinions they may have. You may wish to ask the following questions:
 - a. How did you feel in your role?
 - b. Which groups made particularly strong presentations?
 - c. Whose recommendations do you think the government will follow?
 - d. Which option do you think is best?

As suggested above, you may wish to conclude the lesson by having a class discussion on Questions 5–9 on page 45.



Questions and Answers for pages 38, 40, 43, and 45

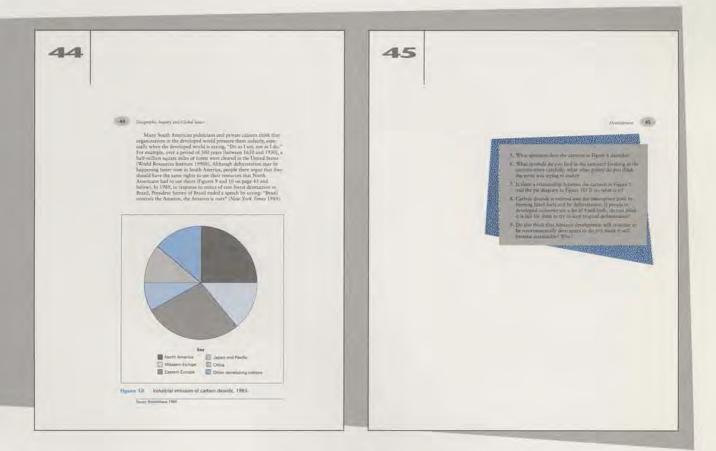
- 1. According to the definition of sustainable development, what are the three main goals?
 - The definition of sustainable development takes a global perspective and suggests the
 following goals: (a) economic growth and development for less-developed nations;
 (b) continued prosperity of wealthy nations; and (c) environmental protection and
 maintenance of ecological balance.
- 2. Do you think that forest collecting is a form of sustainable development? Why or why not?
 - Students answering yes may say that forest collecting is sustainable because no trees are cut down, so it doesn't damage the ecological balance. Students answering no may argue that although forest collecting does not damage the rain forest ecology and it may support small numbers of people, it may not produce a significant amount of development in the region. That is, it is essentially a subsistence economy, which adds little or no increase of wealth for large numbers of people.
- 3. What do you think is the potential for success of extractive reserves in the Amazon?
 - There is no single, right answer. If the reserves were adequately policed so that logging, grazing, mining, and other destructive uses were kept out, they would provide a protected environment for forest collectors.



- 4. To what extent do you think extractive reserves will assure sustainable development?
 - Refer back to Question 2—the answers given can apply to this question. It is not clear that extractive reserves will ensure sustainable development, although there is some evidence that extraction can provide for higher earnings over time than more destructive uses such as logging and cattle grazing. On the other hand, the reading suggests that rubber tapping is not always an attractive occupation, that rubber tappers are leaving the forest to seek work in towns, and that competition from large-scale plantations may threaten the livelihoods of small-scale rubber tappers. Given present knowledge, it seems that forest collection does not interfere with the ecological balance and thus can be sustained indefinitely, but that it may not be able to support large numbers of people and that it is not likely to provide higher levels of income for the forest collectors.

Note: The following questions (5–9) get at the heart of what might be considered a self-righteous attitude of Westerners toward the developing world. Discussion of these issues can provide a good capstone for the case study. See also the *Background Note* on page 33 of this Teacher's Guide that explains the connections among global warming, carbon dioxide, and forests.

- 5. What situation does the cartoon in Figure 9 describe?
 - The developed countries are telling a relatively poor Latin American country not to cut
 down its trees because deforestation increases the level of carbon dioxide in the
 atmosphere. Increasing carbon dioxide concentrations in the atmosphere may cause global
 warming because it enhances the greenhouse effect.



- 6. What symbols do you find in the cartoon? Looking at the cartoon more carefully, what other points do you think the artist was trying to make?
 - Symbols include the fat, rich man; his huge car; the exhaust coming out of its exhaust pipe; the license plate; the donkey; and the skinny, barefoot Latin American peasant. The man with the axe doesn't seem to understand what the rich man is saying. The tree means something very different to him than to the man in the car.
- 7. Is there a relationship between the cartoon in Figure 9 and the pie diagram in Figure 10? If so, what is it?
 - Yes. Cutting down the tree will increase atmospheric carbon dioxide. In Figure 9, the
 developed world is asking the developing world not to do that. But according to the pie
 diagram, emission of carbon dioxide (symbolized in Figure 9 by the exhaust pipe on the
 car) is greater in the developed nations than in the developing nations.
- 8. Carbon dioxide is emitted into the atmosphere both by burning fossil fuels and by deforestation. If people in developed countries use a lot of fossil fuels, do you think it is fair for them to try to stop tropical deforestation?
 - There is no correct answer, so responses will vary. If one is concerned about global warming, it makes sense to reduce atmospheric carbon dioxide from all sources. On the other hand, developing countries correctly point out that widespread deforestation did take place in the developed world in the past, and they argue that they—like the developed countries—also have the right to use their resources as they wish. They also argue that they must use their resources in order to achieve development. Indeed, one of the main goals of sustainable development (see Ruckelshaus's quotation on page 38 in the Student DataBook) is that economic growth and development must take place in poor countries.
- 9. Do you think that Amazon development will continue to be environmentally destructive or do you think it will become sustainable? Why?
 - Responses will vary to this opinion question. Cynics argue that sustainable development is
 an oxymoron! Pessimists predict further rain forest destruction as countries such as Brazil
 continue to view the rain forest as a resource for development. Cautious optimists argue
 that sustainable development will eventually be achieved through the application of new
 knowledge. Environmentalists continue to pressure international banks to make
 sustainability a condition for loans to developing countries. If such a condition is applied,
 this is a strong incentive for borrowing countries to try to manage their resources on a
 sustainable basis.

BACKGROUND NOTE

Global Warming and Deforestation

Scientists have measured a steady increase in the atmospheric concentration of carbon dioxide and other so-called greenhouse gases such as methane and chlorofluoro-carbons (CFCs). These gases trap heat in the atmosphere, and most scientists predict that a continued increase in the concentration of greenhouse gases will cause an increase in the global average surface temperature. This theory is known as *global warming*. The consensus is that global average temperatures could rise from 1.5°C to 4.5°C in the next 50 years.

These gases come from both natural and human sources. The major industrial source of carbon dioxide is caused by burning fossil fuels (oil, gas, and coal) for power generation. Developed countries also are the primary source of CFCs, a family of chemicals used in numerous industrial applications.

Industrial applications.

Deforestation is also a leading contributor to the increase of carbon dioxide. During photosynthesis, plants convert atmospheric carbon dioxide into tissue; this effectively removes carbon dioxide from the atmosphere and stores it in the vegetative tissue. (This is why burning wood and coal, which are fossil plant remains, releases carbon.) Destruction of the forests means that there are fewer trees to take up carbon dioxide, so the atmospheric concentration of the gas is not reduced.



What environmental problems has development caused in Eastern Europe?



Time Required

One 50-minute class period



Materials Needed

Transparency of Overhead 6 Mini-Atlas map 4



Glossary Words

central planning
command economy
development
nongovernmental organization (NGO)

Getting Started

Tell students that this lesson looks at development in another part of the world, namely, Eastern Europe. Ask students for their ideas about what Eastern Europe is like. Hand out Mini-Atlas map 4 and give students time to study it in order to become familiar with the place names and relative location of Eastern Europe.



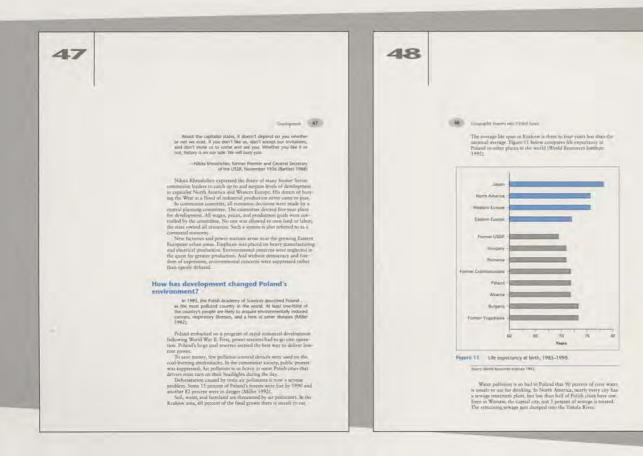
Procedures

What has been the nature of development in Eastern Europe? (pages 46-47)

A. Have students read this section to learn about the Communist's approach to development in Eastern Europe. Khrushchev's infamous statement on page 47 invites students to consider development models other than that found in the free-market West. Project Overhead 6 and discuss with students the differences between a market economy and a command economy. Point out that Khrushchev was referring in his statement to his belief that the Soviet Union, using a command economy, would achieve greater development than the market economies of the United States and the West.

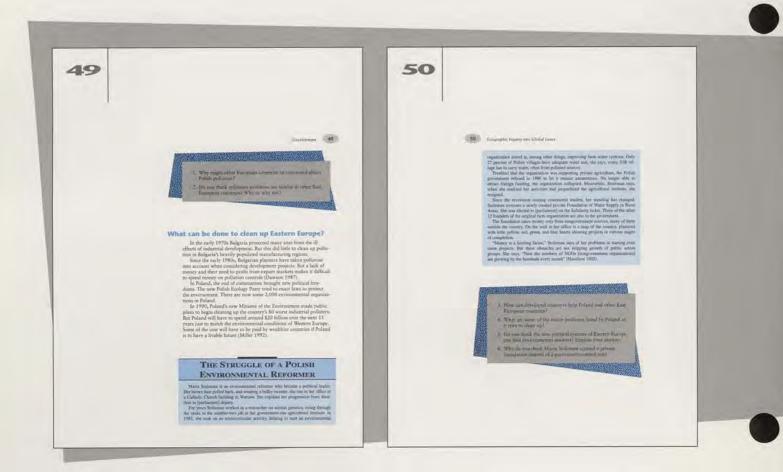
How has development changed Poland's environment? (pages 47–49)

B. Have students read this section and answer Questions 1–2 on page 49, either orally or in writing. As they read, ask them to compare Figure 11 on page 48 with Table 1 on page 6. They can note that life expectancy in Poland is higher than in the developing regions of the world but lower than in Western Europe, North America, and Japan. Ask students to explain how Poland's level of life expectancy might be related to its environmental pollution problems.



Questions and Answers for page 49

- 1. Why might other European countries be concerned about Polish pollution?
 - Students might understand that air and water pollution can cross international boundaries.
 Transboundary air pollution is common and transboundary water pollution occurs via major rivers in industrialized areas. (The Chernobyl disaster is the worst example yet of transboundary pollution. The explosion of a nuclear plant in Ukraine created dangerous fallout, which was carried by winds as far away as Scandinavia. Fallout levels were even recorded in the Pacific Northwest region of the United States.)
- 2. Do you think pollution problems are similar in other East European countries? Why or why not?
 - Environmental pollution has plagued all East European countries, because these countries
 were run by Communist governments that took their directions from Moscow. Rapid
 industrialization with little concern for environmental impacts and suppression of public
 dissent were factors common throughout the Eastern Bloc.



Questions and Answers for page 50

- 3. How can developed countries help Poland and other East European countries?
 - Developed countries can provide loan funds and direct financial assistance as well as
 technical assistance to Poland and other East European countries. Here as well as in
 Question 4, it is worth noting that development and environmental clean-up in Eastern
 Europe is dependent upon global connections, just as development is in the Amazon
 region.
- 4. What are some of the major problems faced by Poland as it tries to clean up?
 - Environmental clean-up requires economic and technical resources, which are very scarce in Poland.
- 5. Do you think the new political systems of Eastern Europe can find environmental answers? Explain your answer.
 - Encourage students to speculate. They might argue that under the new democratic systems
 public opinion will be heard and will command the attention of politicians. This widens
 the range of views considered in making public policy, including environmental policy. It is
 likely that the public will demand a healthy environment along with economic
 development. Previously, under the Communists' goal of rapid industrialization, factories
 had to turn out products at the fastest rate possible, and because public dissent was
 suppressed, environmental costs were not considered.
- 6. Why do you think Maria Stolzman created a private foundation instead of a government-owned one?
 - Encourage students to speculate. Maria Stolzman may have learned from her experience
 under the Communists that government organizations are inefficient. When the
 Communists were ousted, nongovernmental organizations (NGOs) were allowed to
 operate without government interference. This meant they could be more flexible in their
 approaches to solving environmental problems.

What can be done to clean up Eastern Europe? (pages 49–50)

C. After students have read this section, conclude the lesson with a discussion of Questions 3–6 on page 50. You may also wish to have students compare and contrast the role of citizen action on environmental issues in the United States to that in Eastern Europe, both before and after the fall of communism.



How has development affected the Tennessee valley?



Time Required

One 50-minute class period



Materials Needed

Copies of Activity 3 for each pair of students Transparency of Overhead 7



Glossary Word

development

Getting Started

Remind students that this module has emphasized that different countries have various levels of development. Then ask: Within countries, do all regions have equal levels of development? For many countries, the answer is no. Usually the larger the country, the more uneven development is within it. Tell students that this final lesson in the module focuses on regional development in the United States, specifically the development of the Tennessee valley, a region that in the past was extremely undeveloped compared to most other parts of the United States.

Procedures

What is the TVA? (pages 51-53)

A. Have students work on this section in pairs. They can study Figure 12 on page 52 and describe to each other what features they see on the map and what they think is the significance of those features. [The map shows the principal feature of the Tennessee valley project, the large number of dams and associat-



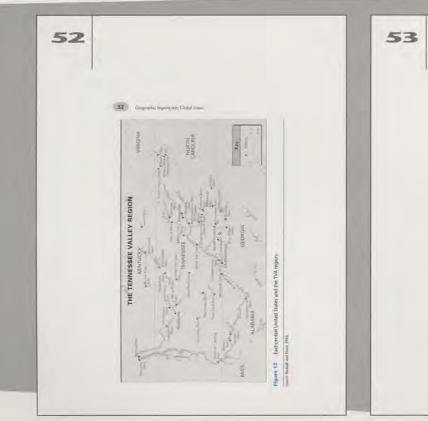
ed reservoirs on the Tennessee, Cumberland, and other rivers in the region. The TVA built these dams to generate hydroelectricity for industrial, commercial, and domestic purposes. The basic idea was to bring about regional economic development by providing cheap power, but the dams also made possible many other uses as described in the reading.]

How well has the TVA worked? (pages 53–55)

- B. Have students try to judge the degree of success of the TVA based on information given in this section. Working in pairs, have students read this section and complete Activity 3. (If time is short, you may skip Activity 3.) To complete Activity 3, instruct students to plot the data from Table 5 on page 54 in the Student DataBook to make two bar graphs. When the graphs are completed, they can be compared with the Key to Activity 3 (Overhead 7), which can be projected on the screen. Even if you skip Activity 3, be sure students study Table 5.
- C. Whether students do Activity 3 or simply study Table 5, ask them to respond to the in-

- text question above the photo on page 53: "Critics of the TVA say that the data confirm that the project has not increased development. Do you agree?" [Students might correctly say that these data are not conclusive evidence of the TVA's success or failure. They could argue for success, however, by saying that without the TVA, these states would likely have shown much less growth in income per capita, that is, the TVA allowed those very poor states to keep up with growth in the rest of the Southeastern United States during these periods.]
- D. Questions 1–4 can be used to focus a concluding discussion. Have students link this lesson back to the lessons on development in the Amazon region. Help them understand that the TVA was a massive development project in a poor, rural area, which means that the Tennessee valley prior to the TVA had certain similarities to the Amazon region. The TVA attacked the problem of uneven development in the United States.

Have students consider whether this study of the TVA has changed their opinions about the propriety of Brazil's development of the Amazon region.



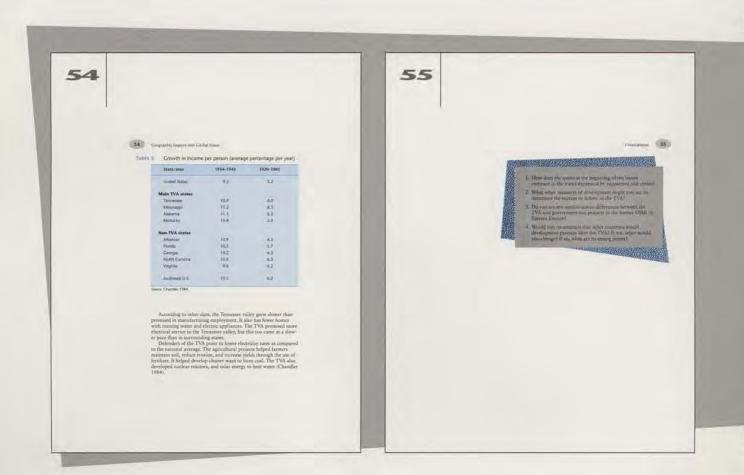


Questions and Answers for page 55

- 1. How does the quote at the beginning of the lesson compare to the views expressed by supporters and critics?
 - The quote from Callahan is strongly, even poetically, supportive of the view that the TVA has been a success.
- 2. What other measures of development might you use to determine the success or failure of the TVA?
 - In addition to growth in income per person for the region, as shown in Table 5, students might mention the expansion of farming because of flood protection, the creation of recreation opportunities on the reservoirs, improvement of river navigation, development of a fertilizer industry, and the research and development of nuclear power in the region. Some students may have prior knowledge of the federal government's research facility at Oak Ridge, Tennessee. Lower electricity rates and agricultural improvement projects were other positive changes brought to the region by the TVA.

When asked to name other measures of development, students might refer to Lesson 1, wherein both qualitative and quantitative measures of development were discussed. Change over time in the Tennessee valley on such measures as literacy, infant and child mortality, life expectancy, educational attainments, and the like offer other measures of development.

continued



- 3. Do you see any similarities or differences between the TVA and government-run projects in the former USSR or Eastern Europe?
 - The TVA was similar in the sense that it was a federally controlled, centrally planned approach to regional development. But the national setting of the TVA was different: In the USSR and Eastern Europe, all national developments were centrally planned and controlled by the command economy, whereas in the United States, the free market dominates the economy.
- 4. Would you recommend that other countries model development projects after the TVA? If not, what would you change? If so, what are its strong points?
 - Encourage students to speculate. There are no right answers. The fact that the TVA has
 been copied in other regional development projects both in the United States and in several
 other countries can be taken as a sign of success. The TVA used a river basin approach,
 which meant that planning and development were based on a natural unit of the physical
 environment.

The TVA was a comprehensive, integrated approach to development. This meant that it dealt with power, transportation, communication, commerce, industry, agriculture, education, and health care together. Students might argue that the integrated, regional planning and development approach be utilized in many developing countries because development is a comprehensive process that must integrate physical and human systems if it is to succeed. It cannot be fostered with piecemeal methods.

Extension Activities and Resources

1. Related GIGI Modules

- Three modules explore environmental issues related to the topics raised in this module. Environmental Pollution focuses on the environmental problems associated with centrally planned development projects in the former Soviet Union; it also includes activities dealing with transboundary pollution.
 Global Climate Change is an in-depth inquiry into the causes and potential consequences of global warming. Sustainable Agriculture explores how farming practices in developing and developed countries can be made to be more environmentally sound.
- Socioeconomic aspects of the development issue are covered in five other modules. Global Economy and Interdependence each deal with world trade and the linkages between regions and countries. The former focuses on Japan, the latter on Australia. Urban Growth examines the problems of uneven development in Mexico, which is one reason why people migrate from the countryside to the cities in developing countries. The module Political Change inquires into what happens when political systems shift between market and command economies. Finally, cultural impacts of economic development are considered in Oil and Society.

2. Britannica Global Geography System (BGGS)

BGGS provides myriad extension activities to enhance each GIGI module. For a complete description of the BGGS CD-ROM and videodiscs and how they work with the GIGI print modules, please read the BGGS Overview in the tabbed section at the beginning of this Teacher's Guide.

3. Related Videos

 EBEC videos "Jungles: The Green Oceans"; "The Coniferous Forest Biome"; "The Tropical Rain Forest"; "South America: Brazil and the Northern Countries"; "Rivers in Danger: The Amazon"; and "International Monetary Fund at Work" explore the issues and regions studied in this module.

For information, or to place an order, call toll-free, 1-800-554-9862.

- Other related videos include: "Living Quarters"; "A Global Market"; "The Disappearing Forests"; and "The Watchkeepers," which are all part of the Spaceship Earth series, PBS.
- All of the following videos are concerned with issues surrounding development in the Amazon region: "Amazonia: A Celebration of Life," World Wildlife Federation; "Unknown Forests," World Wildlife Federation; "Equatorial River: The Amazon," National Film Board of Canada, Bullfrog Films; "Jungle Pharmacy," TBS Inc., Library Tape Sales; "Our Threatened Heritage," 1987, National Wildlife Federation; "Rain Forest," 1983, National Geographic Films; "The Rainforest Imperative," Conservation International, Washington, DC.

4. Writing

- Have students find out about regions of poverty in the United States. The Federal Census is a good source of socioeconomic information. Have students write a report on where and why poverty is regionalized in the United States.
- This module focused on the cultures of the Amazon, but there are forest dwellers in many parts of the world. Have students choose a forest culture and write a report about how the people in that culture relate to their physical environment. What forest products do they use, and for what purposes? How does the forest enter into their spiritual beliefs? Do they harvest forest products in such a way as to prevent permanent damage to the forest ecosystem?

5. Independent Library Project

Have students learn more about the concept of "sustainable development." Students can seek magazine and newspaper accounts of the 1992 United Nations Conference on Environment and Development, held in Rio de Janeiro (the "Earth Summit"). Also of interest is the measures that Brazil took to improve its world image in preparation for this conference, such as clearing its slums and "hiding" its poor people and street children.

6. Class Projects

- Find a tree nursery in your area that will donate a sapling to your school for a class project. Have students learn about the type of tree it is, when and where it should be planted, and how to care for it. Choose a site and plant the tree.
- Many students practice sustainable resource use without realizing it (e.g., recycling, riding bikes, growing their own food).

Have the class create a poster or wall mural that illustrates how sustainable resource use can be integrated into everyday life in the United States.

 Have the class investigate how international citizen concern for environmental quality or social justice has led to changes in investment policies by international banks. Encourage students to seek a personal connection to this idea by investigating and reporting on any local development projects that were altered as a result of citizen concerns.

7. Outside Experts

- Call the governmental agency responsible for managing forests in your area and invite a representative to visit your class.
 Have students prepare questions about the role of the agency in managing forest products and uses.
- Invite representatives from opposing sides in a local development issue to make presentations to your class. Have the students debate the issue after hearing the perspectives of the interested parties.

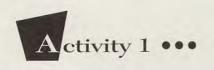
8. Survey

 Have students conduct a survey of people in the school or community to discover people's attitudes toward deforestation or other issues pertaining to economic development in the developing world. Have students write questions that elicit information about people's opinions and their awareness of the development issue and its global consequences. Results of the survey should be presented in both written and graphic form.

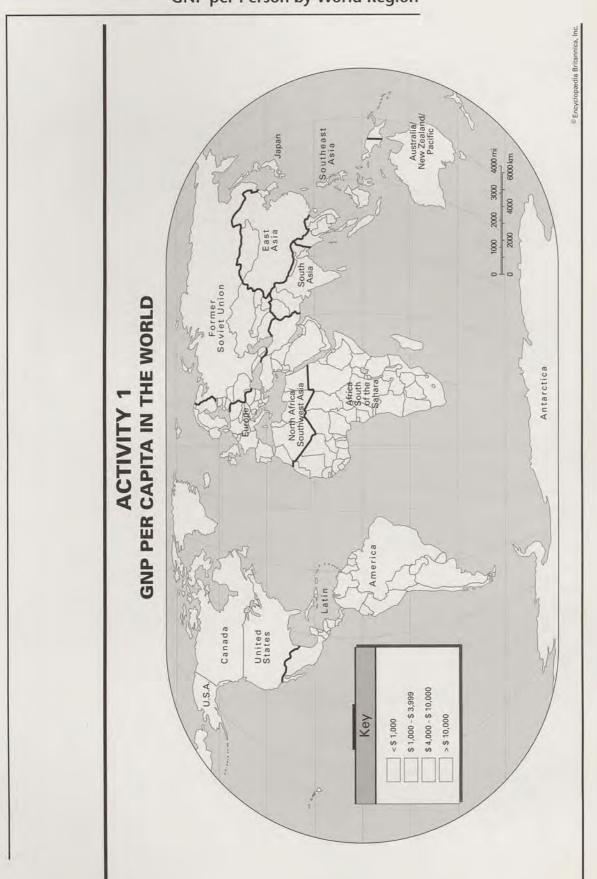
9. Debate

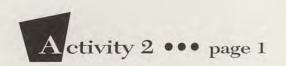
- Have the class compare the nature of development projects underway in Eastern Europe and the Amazon region to the TVA project. Divide the class into those who consider TVA to be a model for development that worked and those who think it needs many modifications. In the manner of an international debate at the United Nations, have the teams address the following issues: (1) Have the team that considers TVA a success argue for its adaptation in Eastern Europe or Amazonia. They should try to persuade other students that cheap energy is a necessary ingredient for development. (2) Have the team that does not consider TVA to be a success offer suggestions for the improvement or even dismantlement of the program. This group should persuade other students that the mistakes of TVA should not be repeated in newer development projects.
- One popular proposal to alleviate foreign debt for developing countries are so-called "debt-for-nature" swaps. Proponents of

these programs argue that international banks should agree to forgive debts on development loans if developing countries (especially those with tropical rain forests) agree to set aside land for nature reserves. Have students find out more about these ideas and report back to class. Structure a debate around the pros and cons of these proposals.



GNP per Person by World Region

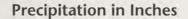


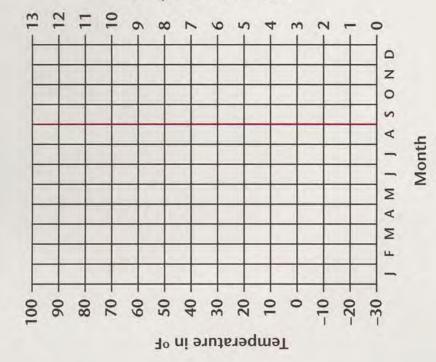


Names _____

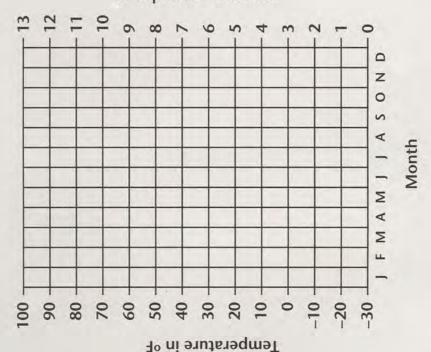
Climographs for Madison, Wisconsin, U.S.A., and Belém, Pará, Brazil

GIGI
Development
Lesson 2





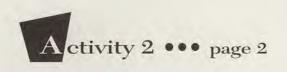
Precipitation in Inches



Station: Madison

Station: Belém

:ource:



Name .		

GIGI

Development

Lesson 2

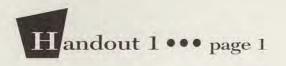
Directions

Table 2 on page 13 in the Student DataBook gives monthly averages of precipitation and temperature for two cities. Make a climograph for each city. First, locate the cities using Mini-Atlas map 1. Then graph the data from Table 2 as follows:

- a. Graph the temperature data according to the left-hand scales. Using a *red* pencil, place a dot in the center of each month's column to show the monthly average temperature. Connect the dots to form a smooth red curve.
- b. Graph the precipitation data according to the right-hand scales. Using a *blue* pencil, draw a line showing the average amount of rainfall for each month. To show the annual pattern of precipitation, make 12 blue vertical bars by shading below each line.

Questions

1.	Even though both locations have different amounts of precipitation, what pattern do they share in common?				
2.	Find the latitude for each location on a world map. What relationship do you notice between the monthly temperature ranges and latitude?				



Roles for the Hearing on the Proposed Xingu River Dam

Development Lesson 5

1. Rancher

You are the founder of the Ranchers' League. You were born into wealth and ranching, and have worked hard to preserve your heritage. Your organization has been overwhelmingly successful, and has achieved a great deal of political power. You elected more than 60 members to the constitutional convention of 1986–1987 (Hecht and Cockburn 1990). Among your members you own the vast majority of livestock in Brazil.

You and your members believe that ". . . the size of the holding only reflects the courage and the competence of the producer" (Hecht and Cockburn 1990, page 197), so most of your members are large landowners. It is your firm belief that small landholders are lazy and incompetent. Their demands for land continue to interfere with your dream of highly capitalized development of the Amazon.

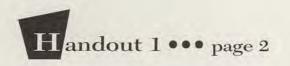
As far as you are concerned, proposed land reforms are the product of communists and subversives. You passionately believe in the defense of tradition, family, and private property, and you will do what is necessary to uphold your way of life, even if you and your supporters must take justice into your own hands.

2. Rubber Tapper

You are secretary of the Rubber Tapper's Union. Your long-time friend and associate, Chico Mendes, was the secretary before his murder a few years ago. You were born and raised on a *seringal* (traditional rubber estate), where your family lived in a state of debt slavery. When you were still a child, the ranchers moved into your area of the Amazon. Thousands of rubber tappers were burned out and forced to leave; many others were killed.

When you were 18, you got involved with the newly formed Rubber Tapper's Union. You took part in the first standoffs between the ranchers and the rubber tappers, and you are now dedicated to winning rights for the forest people through your organization. As the union has become more powerful, its leaders have been targeted for assassination, and you, like the other leaders, are always accompanied by a bodyguard. Like your friend Chico, you fully expect each day to be your last (Hecht and Cockburn 1990).

Lesson 5



3. Kayapo Indian

You are a Kayapo leader of the indigenous people's union and an activist against the ELETROBRAS project for building dams on the Xingu River. You have been jailed for "seditious" acts against the Brazilian government, but are still actively working on behalf of the forest people. If five of the proposed dams are built, 7,000 square miles of rain forest will be under water (Hecht and Cockburn 1990), and many thousands of Indians and other forest people will be homeless.

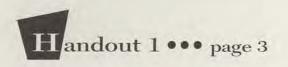
You believe each dam should be resisted.

Although in the course of your work you have traveled more than any of your people, your life is deeply rooted in the rain forest. Your understanding of it is as deep as your understanding of yourself, and you cannot stand by and let the rain forest be drowned.

4. ELETROBRAS Representative

You are an engineer for Brazil's hydroelectric utility agency. You have worked hard for your training in engineering, and you feel strongly that it is time for your country to join ranks with the industrialized nations. You fully understand the consequences of inundating thousands of square miles of rain forest, but you feel that the Amazon is a relatively empty expanse of land with tremendous potential for helping your country develop economically.

Given that possibility, it seems to you that the priority is clearly for modernization and industrialization. Once Brazil's economy is strong, help can be given to the forest people who will be displaced. It is entirely possible, as far as you are concerned, that they will be better off than they were before, in a nation with a healthy economy and higher standard of living for all of its citizens.



Development Lesson 5

5. Amnesty International representative

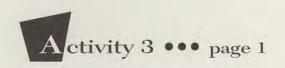
You are one of Amnesty International's corps of human rights investigators. You have traveled to many countries during the course of your work, seen human tragedy on both a large and small scale, and have received several death threats from various organizations that you have "interfered" with.

Amnesty has been very concerned with the human rights violations that are routinely taking place in the Amazon, and during your investigation you have been invited by the Rubber Tapper's Union to take part in this hearing. You have personally documented hundreds of cases of violence against rubber tappers, indigenous people, and settlers, and you are hoping to bring the weight of international opinion down on those responsible.

6. Settler

You are the representative of a local small farmer's co-op. Your family was relocated to the Amazon basin a few years ago. Before that you were coffee farmers, share-cropping on someone else's land. You were part of a government relocation project in which you received title to a small piece of land near the Xingu River. You joined the co-op because of trouble and threats of violence from the henchmen of local land barons and also to get help with a new type of farming technology.

Two of your four children have died: one before you left southern Brazil and one since you settled in your new land. The first died of dehydration from severe diarrhea, the second of malaria. You don't know a single person who has not lost children to the diseases of poverty, and you only hope that you can raise enough food on your small plot of land to keep the remaining two children alive and well.



Names _____

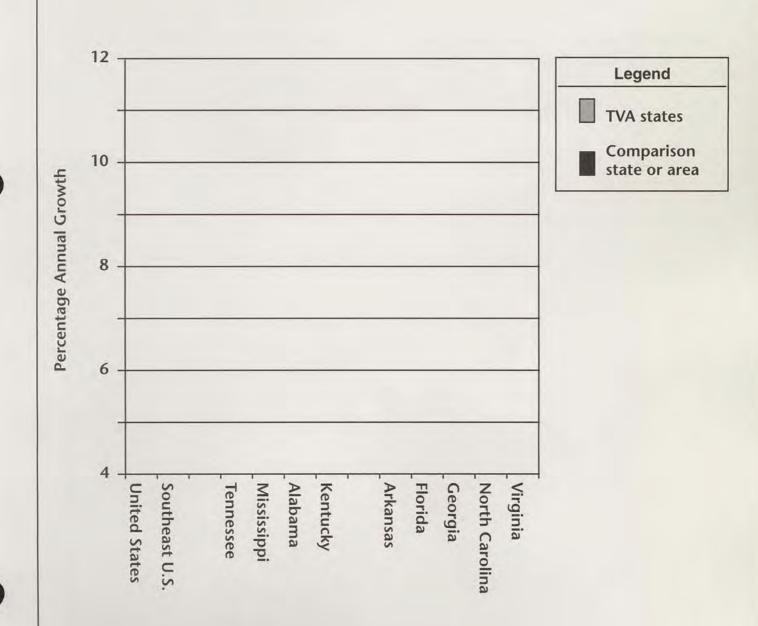
GIGI

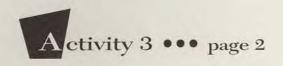
Development Lesson 7

How Well Has TVA Worked?

A Comparison of per Person Income Growth, 1934–1943

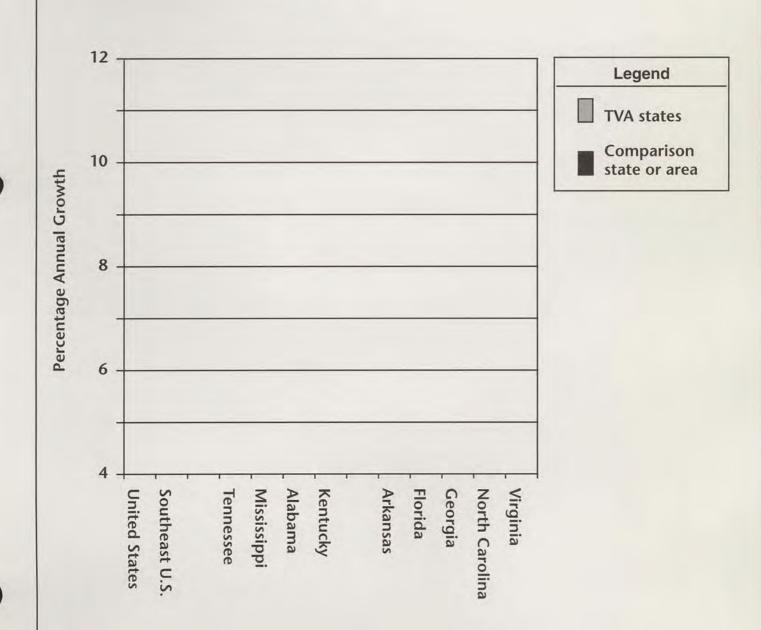
(average percentage per year)





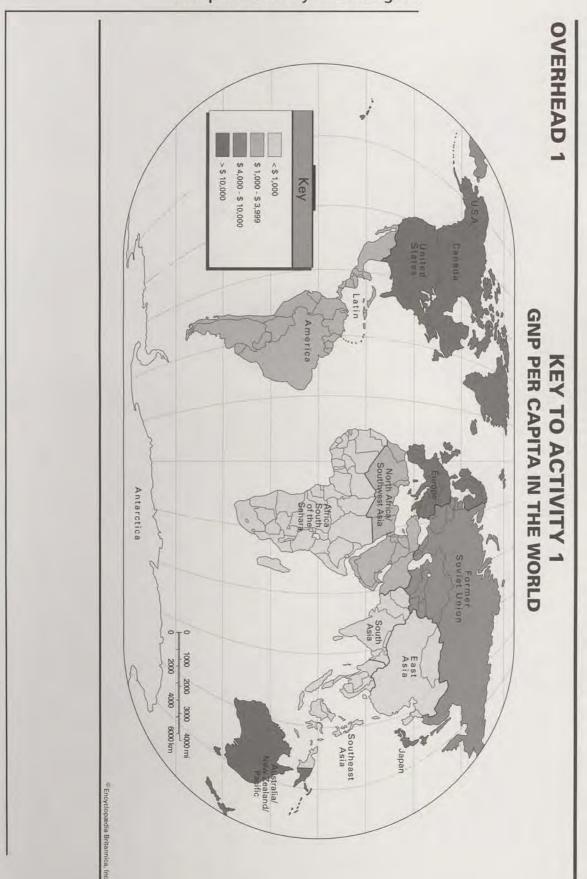
A Comparison of per Person Income Growth, 1929–1981

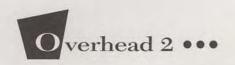
(average percentage per year)



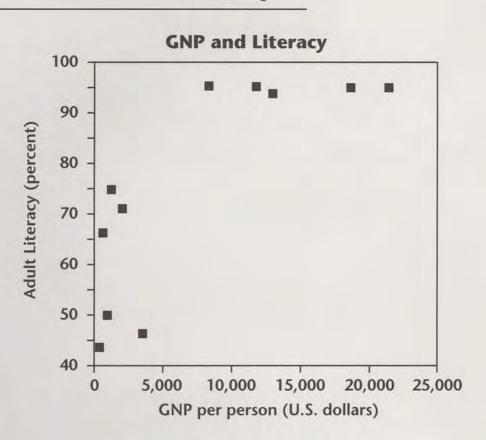
GIGI Development Lesson 1

GNP per Person by World Region

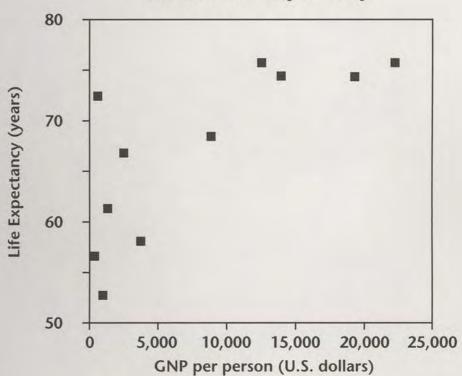




Scatter Diagrams

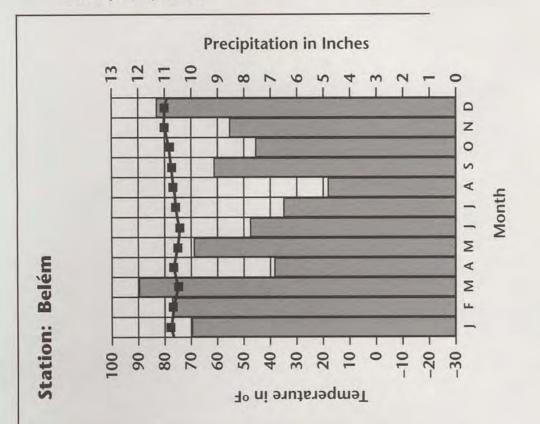


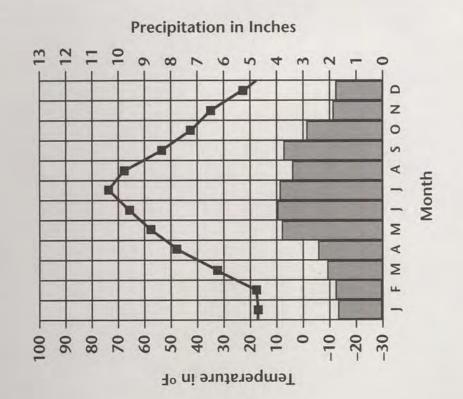
GNP and Life Expectancy



GIGI
Development
Lesson 2

Climographs for Madison, Wisconsin, U.S.A., and Belém, Pará, Brazil



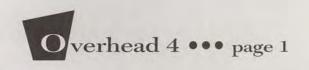


Station: Madison

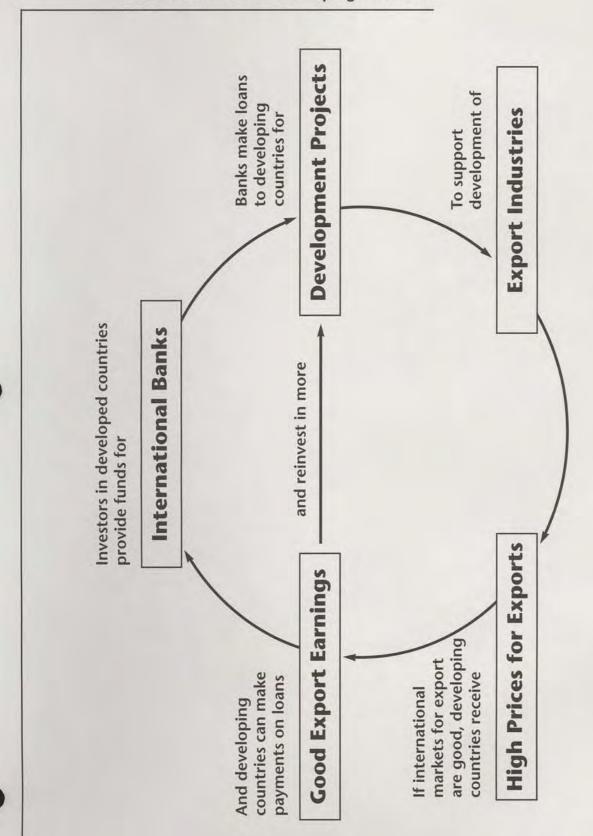
Answers to questions:

- 1. [Each location has both a dry and a wet season.]
- 2. [The average monthly temperature range increases with latitude.]

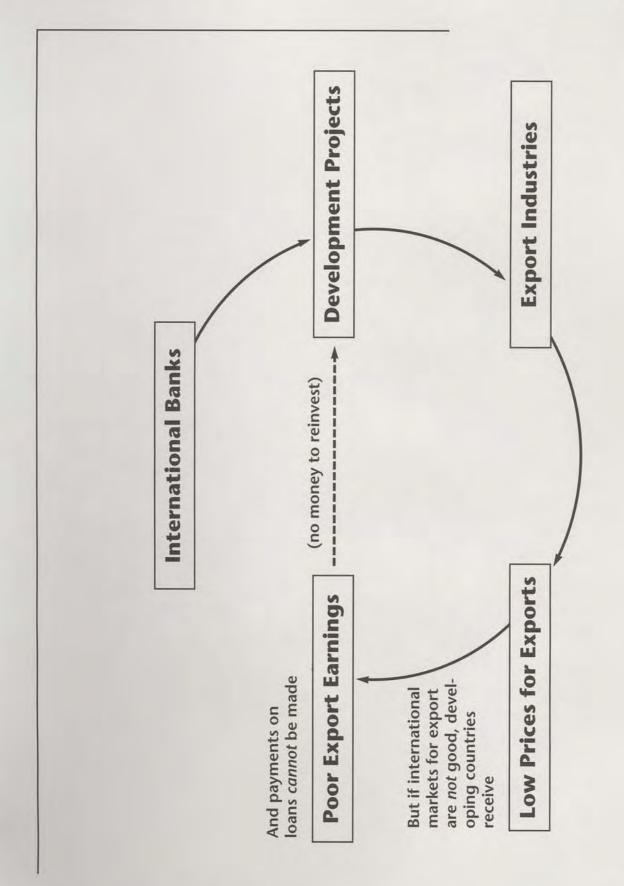
Source: Strahler and Strahler 1989.



Two Scenarios for Developing Countries



GIGI
Development
Lesson 3





Hearing on the Proposed Xingu River Dam

Representatives of the following six groups are meeting in Altamira, Pará, Brazil:

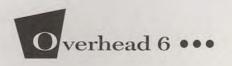
1. Ranchers' League

verhead 5 •••

- 2. Rubber Tapper's Union
- 3. Indigenous People's Union
- 4. ELETROBRAS (the Brazilian government's hydroelectric utility agency)
- 5. Amnesty International (a human rights organization), and
- 6. A local farmers' cooperative.

The Brazilian government proposes to build a dam on the Xingu River in order to generate electricity for industrial development in Altamira. The reservoir behind the dam would flood 800 square miles of rain forest inhabited by Kayapo Indians, rubber tappers, and small-scale settlers.

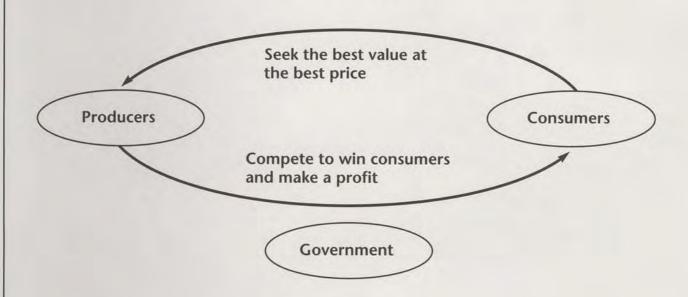
The purpose of the meeting in Altamira is to give the various representatives a chance to respond to this proposal and to make recommendations to the government.



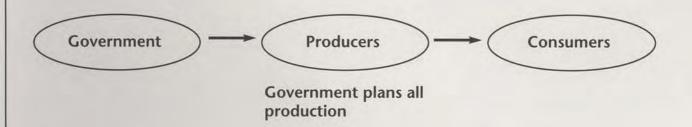
A Comparison of Two Economic Systems

GIGI
Development
Lesson 6

Market Economy



Command Economy

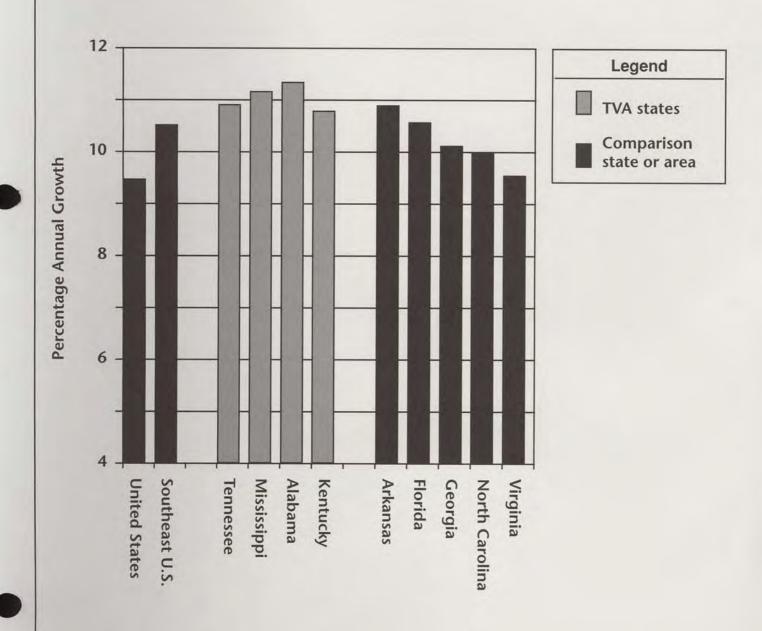


GIGI
Development
Lesson 7

How Well Has TVA Worked?

A Comparison of per Person Income Growth, 1934–1943

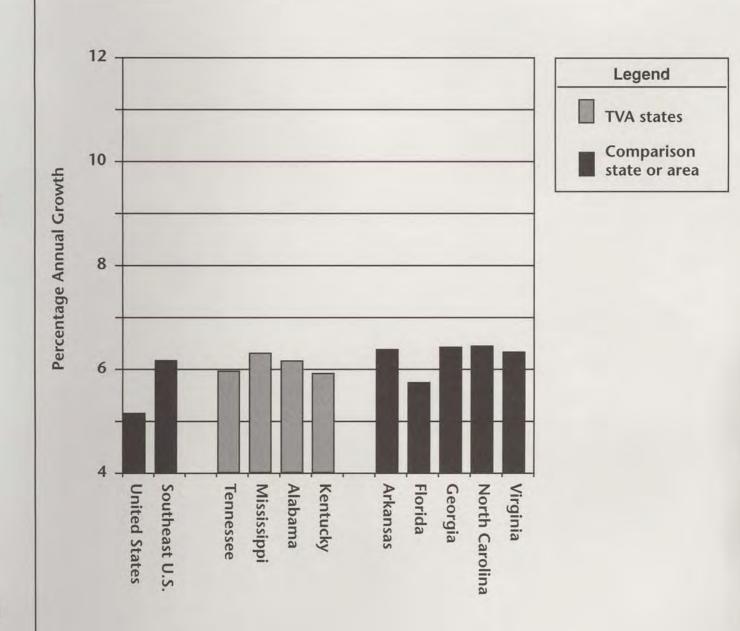
(average percentage per year)



GIGI
Development
Lesson 7

A Comparison of per Person Income Growth, 1929–1981

(average percentage per year)



BRITANNICA GLOBAL GEOGRAPHY SYSTEM

GIGI

Geographic Inquiry into Global Issues

Development

Program Developers

A. David Hill, James M. Dunn, and Phil Klein

Regional Case Study Latin America



Geographic Inquiry into Global Issues (GIGI)

The Center for Geography Education Department of Geography, Box 260 University of Colorado at Boulder Boulder, CO 80309-0260

GIGI Project Staff

A. David Hill, Director James M. Dunn Phil Klein

Project Consultants

Alan Backler Michael Hartoonian Robert Richburg Joseph P. Stoltman

Development

First draft written by Vicki McVey Additional materials by Jeffrey Jon Miller

EBEC Production Staff and Associates

Project Manager: Emily Clott Director, Educational Product Development: Martha Hopkins Design, Editorial, Production: Proof Positive/Farrowlyne Associates, Inc. Senior Buyer: Hazel Janke Logo and Package Design: Richard Laurent

ISBN 0-7826-1214-8

Copyright © 1995

The Regents of the University of Colorado, a Body Corporate

Copyright @ 1995

Encyclopædia Britannica Educational Corporation

Figure 6 from The Global Ecology Handbook by Global Tomorrow Coalition, copyright © 1990 by The Global Tomorrow Coalition. Reprinted by permission of Beacon Press.

Excerpts from "Will pollution kill the revolution?" by John Maxwell Hamilton from the Bulletin of the Atomic Scientists. Copyright @ 1991 by the Educational Foundation for Nuclear Science, 6042 South Kimbark, Chicago, IL 60637, USA. A one-year subscription to the Bulletin is \$30.

Figure 11 from World Development Report 1992, Development and the Environment (New York, Oxford University Press for the World Bank). Reproduced by permission.

Excerpts adapted from "Toward a sustainable world," by William D. Ruckelshaus, from Scientific American, September 1989. Copyright © 1989 by Scientific American, Inc.

Excerpt from "Brazil's guilt in the Amazon massacre," copyright © 1993 by the New York Times Company. Reprinted by permission.

Photo Credits: 22 @ Randall Hyman 31 A. D. Hill 41 Darrell Norris, Ph.D., SUNY Geneseo

This material is based upon work supported by the National Science Foundation under Grant No. ESI 9050204. The Government has certain rights in this material. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors, and do not necessarily reflect the views of the National Science Foundation.

The contents of this book may not be reproduced by any means, electronic or mechanical, including photocopying, except for classroom sets of Activities.

Contents

								-
Memo	to	the	Student	from	the	GIGI	Staff	1

Development: How does development affect peoples and places? 2

The Global Setting of the Issue

Lesson 1 What is development? 4

Major Case Study: Amazonia

Lesson 2 What is the Amazon environment like? 10

Lesson 3 What forces are driving development in the Amazon? 18

How is development threatening native cultures in the Amazon? 27

Lesson 5 Is sustainable development likely in the Amazon? 37

Comparison Case: Eastern Europe

Lesson 6 What environmental problems has development caused in Eastern Europe? 46

Comparison Case: United States

Lesson 7 How has development affected the Tennessee valley? 51

Glossary 57 References 59

GIGI National Field Trial Locations

ons ——

Anchorage, AK

Juneau, AK

Birmingham, AL

Grove Hill, AL

Ventura, CA

Arvada, CO

Boulder, CO

Colorado Springs, CO

Lakewood, CO

Westminster, CO

Wilmington, DE

Nokomis, FL

Lithonia, GA

Marietta, GA

Beckemeyer, IL

Red Bud, IL

Lafayette, IN

La Porte, IN

Merrillville, IN

Mishawaka, IN

Eldorado, KS

Morgantown, KY

Lowell, MA

South Hamilton, MA

Westborough, MA

Annapolis, MD

Baltimore, MD

Pasadena, MD

Detroit, MI

Mt. Pleasant, MI

Rochester Hills, MI

South Haven, MI

St. Joseph, MI

Jefferson City, MO

Raymondville, MO

St. Louis, MO

McComb, MS

Boone, NC

Charlotte, NC

Oxford, NE

Franklin Lakes, NJ

Lakewood, NI

Salem, OH

Pawnee, OK

Milwaukie, OR

Portland, OR

Armagh, PA

Mercersburg, PA

Spring Mills, PA

State College, PA

Swiftwater, PA

Easley, SC

Alamo, TN

Evansville, TN

Madison, TN

El Paso, TX

Gonzales, TX

Houston, TX

Kingwood, TX

San Antonio, TX

Tyler, TX

Centerville, UT

Pleasant Grove, UT

Salt Lake City, UT

Monroe, WI

Racine, WI

Cheyenne, WY

Worland, WY



Memo to the Student from the GIGI Staff



GIGI stands for Geographic Inquiry into Global Issues, which is the name of a series of modules. Each module inquires into a different world issue. We wrote this memo to explain that GIGI is different

from most textbooks you have used.

With GIGI, you can have fun learning if you think like a scientist or detective. The main business of both scientists and detectives is puzzle-solving. They use information ("data" to the scientist and "evidence" to the detective) to test their solutions to puzzles. This is what you do with GIGI. GIGI poses many puzzles about important global issues: Each module centers around a major question, each lesson title is a question, and there are many other questions within each lesson. GIGI gives you real data about the world to use in solving these puzzles.

To enjoy and learn from GIGI, you have to take chances by posing questions and answers. Just as scientists and detectives cannot always be sure they have the right answers, you will sometimes be uncertain with GIGI. But that's OK! What's important is that you try hard to come up with answers, even when you're not sure. Many of GIGI's questions don't have clear-cut, correct answers. Instead, they ask for your interpretations or opinions. (Scientists and detectives are expected to do this, too.) You also need to ask your own questions. If you ask a good question in class, that can sometimes be more helpful

to you and your classmates than giving an answer.

The data you will examine come in many forms: maps, graphs, tables, photos, cartoons, and written text (including quotations). Many of these come from other sources. Unlike most textbooks, but typical of articles in scientific journals, GIGI gives its sources of data with in-text references and full reference lists. Where an idea or piece of information appears in GIGI, its author and year of publication are given in parentheses, for example: (Gregory 1990). If the material used is quoted directly, page numbers are also included, for example: (Gregory 1990, pages 3–5). At the end of the module you'll find a list of references, alphabetized by authors' last names, with complete publication information for the sources used.

To help you understand the problems, GIGI uses "case studies." These are examples of the global issue that are found in real places. "Major case studies" detail the issue in a selected world region. You will also find one or two shorter case studies that show variations of

the issue in other regions.

We hope your geographic inquiries are fun and worthwhile!



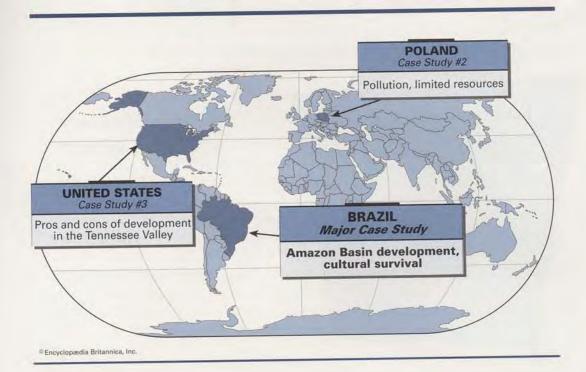
Development

H ow does development affect peoples and places?

- What is development?
- Does development benefit everyone equally?
- What are the forces behind development?
- What kinds of problems are associated with development?

Development refers to economic, social, political, and environmental systems that sustain a high quality of human life. You need to understand development and its effects, both positive and negative, because it will be one of the most important global issues of the twenty-first century. At this time most of the world's people do not enjoy a high quality of life, so they are struggling for development.

In this module, you will examine development and its effects in three case studies. The major case study looks at the development of the Amazon Basin in South America. You will identify the forces of development and the effects these forces are having on the Amazon rain forest and its peoples. The module also examines development in two shorter comparison studies of Eastern Europe and the United States.



Questions You Will Consider in This Module

- Why is it important to view development as a global issue?
- What are the global patterns of development?
- How are richer countries connected to poorer countries?
- Why do developing countries desire development?
- What are the environmental and social consequences of rapid development?
- How can sustainable development be achieved?



What is development?

Objectives

In this lesson, you will

- Define development from different perspectives.
- Distinguish between two paths to development.
- Consider the role of rich countries in development.

Glossary

development gross national product (GNP) oligarchy

How is development defined and measured?

Underdevelopment is shocking: the squalor, disease, unnecessary deaths, and hopelessness of it all! . . . [It] is a sense of . . . confusion and ignorance as one gropes to understand change, . . . of hopelessness before hunger and natural catastrophe. Chronic poverty is a cruel kind of hell; and one cannot understand how cruel that hell is merely by gazing upon poverty as an object (Goulet 1973, pages 23–24).

The quotation above contains a definition of development we will find useful. Can you find it?

If you are having trouble, you are not alone! Geographers and other social scientists wrestle with definitions like these that concern human welfare. As for a definition of development, one reason it is hard to find is that development is a continuous *process*, not something static and unchanging.

The words Goulet used actually did contain the definition we are looking for. The words *ignorance* and *confusion* tell us something about the importance of education. The words *unnecessary deaths* and *disease* refer to health care and life expectancy. Finally, the words *squalor*, *hunger*, and *poverty* refer to economic conditions and income.

When viewed from a broad human perspective, development has three core values (Todaro 1977):

- Life sustenance—the ability to provide basic necessities. All
 people have life-sustaining needs, such as food, shelter, health,
 and protection.
- Self-esteem—the ability to be a person. Persons have a sense of worth and self-respect, of not being used as a tool by others.
- Freedom from servitude—the ability to choose. People are free from ignorance, misery, dogmatic beliefs, and other persons or institutions that would enslave them.

Development can also be measured with numbers. Table 1 on page 6 gives numerical indicators of development. Because development is a process, try to see how these indicators work *together* to define the regions we will refer to as "developed" and "developing." See Figure 1 on page 7 for the regional boundaries used in Table 1. When measured by the indicators in Table 1, note that development is very uneven across the globe.



Women and children work long hours carrying water.

Table 1 Selected development indicators by world region

Region	GNP per person (U.S. \$)	Average life expectancy (years)	Adult literacy (percentage of population)
South Asia	273	56	44
East Asia	507	72	66
Africa—south of the Sahara	639	53	50
Southeast Asia	833	61	75
Latin America	1,553	67	71
North Africa/Southwest Asia	3,045	58	46
Former Soviet Union	8,375	69	95+
Australia/New Zealand	11,170	76	95+
Europe	12,621	75	95+
U.S.A./Canada	18,400	77	95+
Japan	21,020	78	95+

Sources: World Bank 1990; National Geographic Society 1990.

- 1. In what way are the three indicators in Table 1 related to each other?
- 2. Based on these three indicators, how might a developing country be different from one that is developed?
- 3. What other indicators can you think of that might be useful in measuring development?
- 4. Why are numerical indicators of development useful?
- 5. Why might such measures be limited?
- 6. Based upon the data in Table 1, in which regions of the world would you be most likely to find the conditions described in Goulet's statement?

Sanston State Control of the State of the St

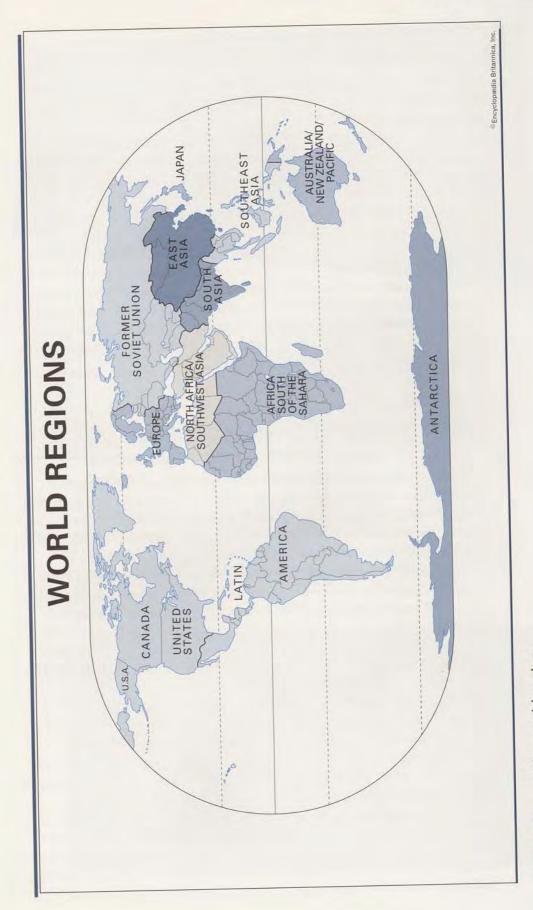


Figure 1 Major world regions.

How is development achieved?

There are many theories about development. In reality, there are probably as many routes to development as there are countries that have made the journey. We can identify two main pathways to devel-

opment (Rubenstein 1992).

Path 1: International trade—A country that develops by international trade must have a resource or commodity that other countries want. Whether T-shirts, timber, or tungsten, a country can make good use of its resources and human talents and earn income by trading. That money can then be re-invested to increase the growth of successful export industries.

Path 2: Self-sufficiency—Here the emphasis is not on production for export but on production for the domestic (home) market. What money is made from resulting economic growth is invested in many different industries, not just the few that export goods. The rate of economic growth will be modest, but there is less risk. This "don't put all your eggs in one basket" approach protects the economy from global competition and price fluctuations.

The two paths and developed countries

Rich countries can help poor ones regardless of which path to development the latter have chosen. This help can take many forms, such as loans, investment, or grants. The intent is to help poor nations modernize industries and build roads, power stations, and schools—all of which are needed for development to occur.

On the negative side, the rich countries have often gained their wealth through the exploitation of developing regions. For instance, one of the leading causes of the American Revolution against the British Empire involved the export to England of North American raw materials. Colonial Americans did not get to profit from their own labor and resources because they were not given the political representation that would have given them that control.

Many developing countries today are in fact former European colonies like the United States. These former colonies may still be economically dependent on the rich countries (Fisher 1992).

The health of the world economy is strongly influenced by development in poorer countries and regions. Investment in and assistance to poor countries is a goal for many developed countries.

Thus, the rich countries have tried to nudge developing countries toward economic progress. Sometimes these efforts have succeeded, but often they have failed. And, of course, poor countries have been directing their own efforts toward development. These efforts have also met with mixed success.

- 7. What do you think are some advantages and disadvantages of the "international trade" path to development?
- 8. Would self-sufficiency be a better option for developing countries than international trade? Why or why not?
- 9. Why do you think some richer countries have exploited poorer countries?

Development is complicated with many causes and effects. Although every region is different, the problems of development are similar. This is what one expert said about developing regions:

Most underdeveloped countries show the same pattern of gross social and economic inequalities, and the inequalities seem to be increasing almost everywhere. Most of these countries, whatever their form of government, are ruled by small . . . oligarchies . . . (Myrdal 1970, pages 452–453).

Just as wealth is concentrated in a few rich countries, wealth in poor countries is also concentrated in the hands of a small segment of the population. This is especially true in Latin America, to which we turn for a case study of the Amazon region, where development is being pushed very fast.



Lumbering is a growing industry in the Amazon region.



What is the Amazon environment like?

Objectives

In this lesson, you will

- Compare views of rain forest resources.
- Understand the relationship between climate and vegetation in tropical areas.
- Identify resources from the Amazon that are used in developed countries.

Glossary Words

biodiversity development ecosystem leach

What images do people have of the Amazon region?

When you hear the word *Amazon*, what comes to your mind? Do you think of a mighty river or of vast rain forests? Below are two descriptions of the region, the first from an English explorer and the second from an Indian resident of the area. How does each person see the region? Which is closer to your own image?

IMAGES FROM AN ENGLISH EXPLORER IN 1958

In a few minutes we were down by the river swimming our guns and clothes across. It was dark, without a moon, and we marched for two hours depending on the Indian [guide]'s knowledge of the country. When the dawn arrived we were in the deep forest of the swamp territory by the Kuluene River. Kaluana [the guide] weaved amongst the trees and tangles of scrub; I stumbled behind. Huge tree trunks soared into the sky above and mysterious alleyways and false paths led off through the brush and saplings on either side. It was the confusion of a nightmare, and I thought of the many occasions I had imagined with pleasure this moment of first entry into [this] forest. . . . I had always pictured a tall rampart of trees and then myself as the leader of a brave little group that would slip between the portals of two gnarled trunks into the jungle within. The Indians would point out orchids, creepers, and bushes. They would describe the trees and show me the different types of medicinal roots and leaves. . . . Instead we had entered blindly in the night, and now there was such a mass of detail that it completely overwhelmed [my] untrained senses. The vegetation concealed the forest as effectively as a fog hides the buildings of a London road (Cowell 1961, page 30).

IMAGES FROM AN AMAZONIAN INDIAN IN THE 1980s

In the indigenous cycle of things, when we stayed too long in an area we would see that the game fled and that people's dreams were no longer good, and so we would leave. . . . But that place was not lost to us or abandoned because sometimes we had our dead there, and we knew that we would always return, and so for this reason we would plant fruits, medicines, and magic plants for this life and for the other forest lives that would follow us. We saw that forest not as a wild bunch of trees, but as a place in which our history and our future was written; the trees planted to remember the dead or to provide someday for our sons and daughters. The forest is not a wild thing to us. It is our world (Hecht and Cockburn 1990, pages 242–243).

- 1. What kinds of feelings did each description evoke in you as you read it?
- 2. What differences do you find between the two accounts of the Amazon?
- 3. If the two accounts could be said to represent two different groups, which group would you guess is directing development in the Amazon? Why?

What is the climate of the Amazon like?

The Amazon region can be referred to in several ways. The area or region drained by the Amazon River is known sometimes as *Amazonia* or the *Amazon basin*. Other times, the word *Amazon* alone refers to the region as a whole, not just the river.

The Amazon basin is located in the low latitudes, from just north of the Equator to far south of it. This position on the globe indicates a region of nearly equal days and nights, with the sun high in the sky every day. No real seasonal changes are evident in either the trees or the temperature. Table 2 compares some of the climate characteristics of Madison, Wisconsin, U.S.A., and Belém, Pará, Brazil (near the mouth of the Amazon River).



Boys enjoy a swim in the Amazon River.

- 1. What kinds of feelings did each description evoke in you as you read it?
- 2. What differences do you find between the two accounts of the Amazon?
- 3. If the two accounts could be said to represent two different groups, which group would you guess is directing development in the Amazon? Why?

What is the climate of the Amazon like?

The Amazon region can be referred to in several ways. The area or region drained by the Amazon River is known sometimes as *Amazonia* or the *Amazon basin*. Other times, the word *Amazon* alone refers to the region as a whole, not just the river.

The Amazon basin is located in the low latitudes, from just north of the Equator to far south of it. This position on the globe indicates a region of nearly equal days and nights, with the sun high in the sky every day. No real seasonal changes are evident in either the trees or the temperature. Table 2 compares some of the climate characteristics of Madison, Wisconsin, U.S.A., and Belém, Pará, Brazil (near the mouth of the Amazon River).



Boys enjoy a swim in the Amazon River.

Table 2 Climate data for Madison, Wisconsin, U.S.A. and Belém, Pará, Brazil

	Ma	dison		elém		
Month	Temper- ature (°F)	Precipitation (inches)	Temper- ature (°F)	Precipitation (inches)		
January	18	1.7	79	10.0		
February	19	1.8	78	10.8		
March	32	2.1	77	12.0		
April	47	2.4	78	6.8		
Мау	58	3.8	77	9.9		
	66	4.0	76	7.8		
June	72	3.9	76	6.5		
July	69	3.3	77	4.8		
August September	63	3.8	78	9.1		
October	52	2.8	79	7.5		
	35	1.9	80	8.6		
November December	22	1.8	80	11.3		

Source: Strahler and Strahler 1989.

- 4. What is the range of temperature in Madison between the summer and the winter? In Belém?
- 5. What is the range of precipitation in Madison between the summer and the winter? In Belém?
- 6. What is the average amount of precipitation received annually in Madison? In Belém?

The Amazon River's source can be found high in the Andes Mountains. The Andes promote rainfall and snowfall to feed the headwaters of the Amazon. The Amazon River then flows east, across the northern half of Brazil, for more than 4,000 miles, to the Atlantic Ocean. The Amazon region covers a vast territory, almost two-thirds of the area of the entire United States (Figure 2 on page 14).

The Amazon River and its thousands of tributary streams contain one-fifth of all the river water in the world. At its mouth, the Amazon River is 200 miles wide. The Amazon is so deep that oceangoing vessels can travel as much as halfway upriver before shallow depth forces the use of smaller boats.

What is the vegetation of the Amazon like?

The broad lowlands of the Amazon basin are mainly covered by tropical rain forest. The tropical rain forest has become a familiar place to people around the world, as television and newspapers regularly report on how it is being used and abused. Even so, there are mistaken ideas about this ecosystem. For instance, its heavy vegetation fools outsiders into thinking that the rain forest is supported by fertile soils. That is not the case.

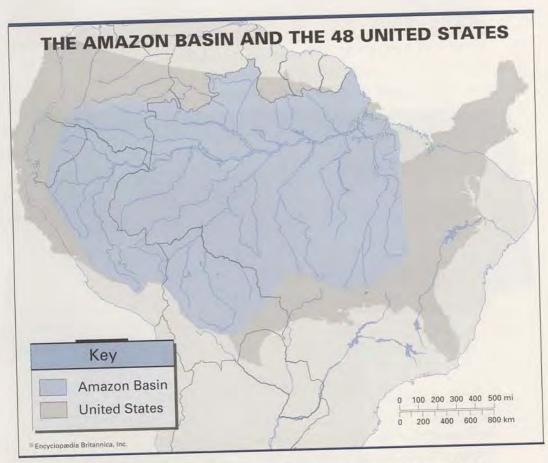


Figure 2 The area of the Amazon basin in comparison with the contiguous 48 United States.

So why does the tropical rain forest *appear* to be the most fertile place on Earth? Unlike nutrient-rich midlatitude soils (as in North America's Great Plains), the nutrients in the rain forest are stored in the vegetation itself, not in the soil.

If it seems a little strange to you that so much vegetation can take root in poor soil, consider again the climate conditions of the region: warm temperatures and heavy precipitation throughout the year. When a plant dies in this warm, moist environment, it is rapidly consumed by microorganisms before it can become part of the soil. The nutrients cycle through the vegetation, but not the soil.

If the plants are removed entirely, such as when the forest is cut down, the nutrients are removed. The heavy, frequent rains will wash the remaining nutrients away in streams (a process called *leaching*). Replanting such ground would require application of artificial fertil-

izers to replenish the soil.

Rain forests will grow back if the cleared plot of land is small. But large-scale forest clearing (known as deforestation) may make it impossible for the rain forest to grow back. Large areas of bare land increase water runoff onto nearby forested areas. This can weaken root systems that help hold the soil together, leading to erosion and even more deforestation.

Also, some climate scientists believe that widespread deforestation can alter patterns of temperature and precipitation. Because the trees themselves act to create cloudiness and rainfall (by transpiring moisture into the atmosphere), forest removal may lead to a hotter and drier climate. Changing the climate could lead to more deforestation in the Amazon basin.

- 7. Why is it difficult to reclaim rain forest ecosystems when they are damaged?
- 8. Why would rain forest soils be poor for crop agriculture?
- 9. What do you think would be the best way to ensure that rain forest ecosystems remain healthy?

What resources does the Amazon basin have?

Rain forest life-forms differ greatly from those in midlatitude forests, or for that matter, from most other ecosystems. The Amazon region contains a great variety of plant and animal species. The term used to refer to the number of different kinds of species an ecosystem supports is *biodiversity*. Biodiversity increases when larger and larger numbers of species are present in a given area.

No ecosystem on Earth has greater biodiversity than tropical rain forests. A few square miles of tropical rain forest may contain over 3,000 tree species. This is about 10 times the number of species in *all* of the midlatitude forests in North America. Those same few square miles of tropical rain forest also are home to over 20,000 insect species—about 100 times the number of insect species found in all of France.

Plants and animals can be considered resources in the same way we think of resources that are nonliving (such as minerals). For example, drugs and medicines can be derived from rain forest plants. A diversity of resources of any kind is considered essential for economic development. Examine Table 3 on page 17 and note how biodiversity contributes to the resource base of the Amazon region. Later lessons will show how this great wealth of biological and mineral diversity attracts development efforts.



Settlements cling to streamsides in the Amazon rain forest.

Table 3 Examples of resources found in the Amazon basin

Crops	Other plants		
Rice	Mahogany		
Black pepper	Other tropical hardwoods		
Manioc	Jute		
Beans	Rubber		
Corn (maize)	Medicines		
Minerals	Energy resources		
Iron (hematite)	Oil		
Aluminum (bauxite)	Natural gas		
Gold	Coal		
Silver			
Copper			
Manganese			
Titanium			
Silver			
Nickel			
Tin			

Sources: Fisher 1992; Boehm and Swanson 1989; and Miller 1992.

- 10. Obtaining some of the resources in Table 3 would require cutting down the rain forest. Which resources do you think these are?
- 11. Which of the resources in Table 3 do you think could be obtained without damaging the rain forest ecosystem?



What forces are driving development in the Amazon?

Objectives

In this lesson, you will

- Identify the interests seeking to profit from development.
- Compare the productivity of small- and large-scale farming in the Amazon.
- Relate consumer demand in developed countries to resource extraction in developing countries.
- Understand the role of foreign banks in development.

Glossary Words

developed country
developing country
development
petty extraction
sustainable agriculture

Who has sought to profit from the Amazon?

The Amazon basin has a vast amount of sparsely inhabited land containing many natural resources. These include gold, iron, timber, rubber, and other forest resources. The nations with territory in Amazonia are developing countries. They expect to use these resources for their national development. Thus, they have encouraged certain interests to exploit these resources.

The main interests seeking to extract resources and produce profits from the region are farmers, cattle ranchers, miners, and loggers.

Fortunes are being made by some individuals and corporations. But in the rush for development, some projects have failed because of poor planning, lack of financing, ignorance about the environment, or other reasons. Many projects have caused tremendous environmental damage.

In Brazil, for example, the Polonoroeste Program (PNP) was designed to promote sustainable agriculture in the Amazonian state of Rondônia (Figure 3 below). But PNP missed its goal drastically.



Figure 3 Brazil's states.

The PNP sought to resettle small farmers from southern Brazil, where small coffee farms were being converted to large soybean farms. Soybean production, unlike coffee, relies much more on machines than on human labor. As a result, thousands of coffee workers were thrown out of work. The PNP gave plots of land in Rondônia to many of these workers.

The PNP created severe environmental problems in Rondônia. For instance, farmers and ranchers deforested one-fourth of the area in eight years. Although government policies are beginning to change, in the past the government required people to clear the forest in order to claim land. This encouraged settlers to make a fast profit by clearing their land, selling it to large ranchers, and moving on to new land (World Resources Institute 1990a).

Wealthy investors and corporations got hold of large tracts of land. They usually cleared the forest cover and turned the land into large cattle ranches. This created social conflict with people known as petty extractors. Petty extractors are small-scale collectors of forest products, such as rubber and Brazil nuts, who do not cut down trees to obtain their goods. Because parts of the forest were already being used by petty extractors, land disputes and violence occurred with the conversion of large pieces of forest land to cattle ranches.

As you learned in Lesson 2, tropical rain forest soils are generally infertile, because most of the nutrients are stored in the vegetation rather than the soil itself. Once the trees are removed, the soil cannot support repeated harvests of food crops. Therefore, many small farming projects have failed. In addition, ranching causes other problems. For example, cattle hooves compact the soil so that it won't support good grasses. An estimated 20 percent of the large ranches in the Amazon have already been abandoned (World Resources Institute 1990a).

Another activity being pursued in the Amazon basin is mining. Large-scale mining activities compete with Indians and petty extractors for land. Large-scale projects, like mining, are often favored by governments looking for ways to rapidly develop their economies.

Large-scale mining, like large-scale farming and ranching, is highly mechanized. Jobs that might be done by people who need income are done by machines. Small-scale activities in Pará, Brazil (Figure 3 on page 19), on the other hand, employ many more people, but produce modest, though significant, results (Table 4 on page 21). For Brazil as a whole, small holders occupy only 12 percent of the land, but they produce about 80 percent of the food.

Table 4 Differences in small- and large-scale farms in Pará, Brazil, 1980s

	Percentage of all private land	Percentage of rural workers	Percentage of farm product value
Smallest farms			
(less than			
240 acres)	20	82	65
Largest farms			
(greater than			
2,400 acres)	60	3	13

Source: Hecht and Cockburn 1990.

The founder of the Ranchers' League, a group representing largescale ranchers in Brazil, made this comment:

It's not enough for people to just have land. You need to have "know-how," machines, credits, and things. Since rural workers have none of those, their productivity is low, and in the end when you analyze their harvests, they didn't even produce enough to support themselves (Hecht and Cockburn 1990, pages 196–197).

- 1. Is the comment by the founder of the Ranchers' League supported by the data in Table 4? Why or why not?
- 2. Why do you think the founder would make this statement?
- 3. Why do you think government policies favor large-scale development activities rather than petty extraction and small-scale farming?

What role do rich countries play in Amazonian development?

Developing countries sell their products abroad, usually to rich countries. Also, corporations and individuals in developed countries invest in Amazonia. These are some of the industries and operations they finance and profit from (Miller 1992):

- Cattle ranches that export meat and hides
- · Paper mills and logging operations
- High-value export crops like bananas and sugar cane
- Illegal drugs such as marijuana and cocaine
- Mining operations
- Dams that produce power for mines and factories

Individuals in rich countries are often not aware of the roles they play in developing countries. For example, consider "The Hamburger Connection," on page 23. For another example of the role that rich countries play in Amazonian development, look at "The Planned Road to Japan" (pages 23–24).



Corporations and individuals invest in Amazonian cattle ranches.

THE HAMBURGER CONNECTION

You may think the hamburger meat at your favorite fast-food restaurant is of U.S. origin. Western Europeans, by contrast, expect that most of their beef is *not* a product of their country. But both you and the Europeans may be surprised and dismayed to know the true origin and cost of hamburgers and other beef products like pet food.

One-third of Amazonian deforestation from 1965 to 1983 resulted from land clearance for cattle ranches that sold beef to Europe. Similarly, land has been cleared to raise cattle for beef sales to North American restaurants and groceries. Why have cattle ranches been established in Latin America when North America can produce more than enough beef for those markets?

A rancher says in reply: "It boils down to \$95 per cow in Montana versus \$25 in Costa Rica." If you were a beef producer, you might not be able to refuse such a deal—a savings of \$70 per cow. But as a consumer, your savings comes out to only 5 cents per pound. So, much of the "savings" gets pocketed as profit by meat exporters, not passed down to consumers (Miller 1992).

- 4. Why do you think cows are so much cheaper in Costa Rica than in Montana?
- 5. How are you connected to the beef industry in Latin America?

THE PLANNED ROAD TO JAPAN

Many species of tropical hardwood trees, such as mahogany, are found in the Amazon. These are highly valued when made into furniture and other wood products. Japan is the world's largest importer of tropical hardwoods, consuming some 40 percent, followed by the United States. Timber corporations from those countries and from Western Europe supply the majority of cut timber sales to other developed countries. The high demand for paper products in Japan and its own scarce domestic timber supplies have driven the timber industry to look to Amazonia.

Part of the cost of shipping involves transportation out of the forest. A Brazilian government highway project has been the subject of hot international debate. The highway's purpose is to help open a door to Japan, over 10,000 miles away.

The road would start in Brazil's great manufacturing district around São Paulo (Figure 3 on page 19) and proceed northwest, through the rain forest in Rondônia and Acre to the Pacific coast of Peru. At the Peruvian port, logs and wood products could be loaded onto ships for the remainder of the journey to Japan (Jackson 1992).

The same port could then be used to transport Japanese products for sale to Peru, Brazil, and other places in South America. The construction of the road and port would spur regional economic development. Such improvements can drive development efforts. But they cost a great deal of money.

- 6. How would the new highway help Brazil and Japan?
- 7. What kinds of land use and environmental effects would you predict in the area on either side of the highway?

ALTO TAKE OF THE PARTY OF THE P

How has development brought foreign debt?

How could you spend more than you earn? That's what many Latin American countries have been doing, in their drive to develop rapidly. They've been doing it by borrowing the money from foreign banks. (Usually, these are "international development" banks that are funded by the rich countries.) The money is spent on seaports, roads, sewers, dams, schools, factories, mines, and many other things needed for development. The spending, especially in the 1960s through 1980s, was greater than the countries' earnings. This meant that the foreign debt of these countries kept increasing.

The foreign debt of Latin American countries climbed into the billions of dollars. In 1987, it reached about \$1,000 for every person in the region, or about 64 percent of the region's total income (World Resources Institute 1990a). In other words, 64 cents out of every dollar they had was already owed to somebody else. Among these countries, Brazil ran up the largest foreign debt (Figure 4 on page 25). The pressure to pay back such huge foreign debts stimulated countries like Brazil to speed up their rush for development even more.

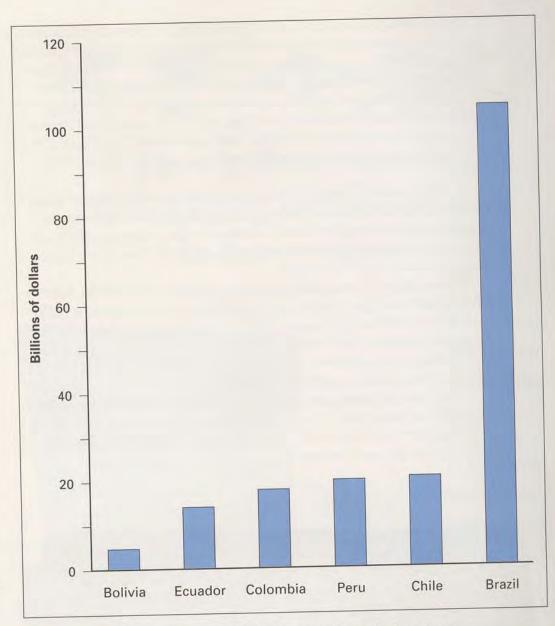


Figure 4 External public debt in selected South American countries, 1987.

Source: World Bank 1990.

What role do development banks play?

One good question is whether all the projects being funded are worth such huge debts. The major banks that make development loans in Latin America are the World Bank, the International Monetary Fund, and the Inter-American Development Bank. They are called multilateral banks because they are run by boards of directors from many different countries (Rich 1990).

In the Amazon, and in Brazil in particular, loans from multilateral banks have aided the development process by financing farms, ranches, roads, mines, and dams. But some of these projects have had serious negative effects on the environment and on local populations.

One of the largest and most disastrous agricultural projects in the tropics was Brazil's Polonoroeste Program (PNP) mentioned earlier. This program cost over \$1.6 billion and contributed significantly to deforestation and to the death of many Amazonian Indians (Rich 1990).

In 1985, under pressure from international environmental groups, the World Bank suspended its loans to the PNP. This was because Brazil wasn't meeting the Bank's conditions for protecting the environment and the Amazonian Indians (Rich 1990). But other large projects continue to be funded.

One of these is Brazil's electric utility project. The World Bank is lending over a billion dollars for "Plan 2010," which aims to build over 136 new dams by the year 2010. Sixty percent of the dams will be in the Amazon rain forest. The government estimates that if just five of them are completed, 7,000 square miles of forest will be flooded (Hecht and Cockburn 1990).

Development banks are learning to withhold loans until careful research has been done. The World Bank is beginning to respond to worldwide concern about the negative effects some of its projects have had on the environment.

8. What are the pros and cons of lending money to countries that want to develop?

THE PROPERTY OF THE PARTY OF TH

9. How will developing countries pay back their heavy foreign debts?



How is development threatening native cultures in the Amazon?

Objectives

In this lesson, you will

- Relate Amazonian history to present-day development.
- Understand the relationship between economic development and ecological and cultural change.
- Evaluate whether Amazon Indian culture can survive development in the region.

Glossary Words

caboclos development ecosystem petty extraction

What is Amazonia's colonial legacy?

Prior to the nineteenth century, Latin America was divided into colonies of Spain and Portugal. In the Amazon there was a chronic shortage of labor to work colonial plantations. Indians were seen as a solution to the labor shortage. In the earliest years of colonial occupation, the Indians were enslaved. Later, there were political reasons for freeing the Amazon tribes from slavery. But even after they were given citizenship, the Indians were used by local governments as a source of free labor (Hecht and Cockburn 1990).

Amazonia still reflects patterns from colonial times. For example, most of the land in Brazil today is owned by a very small segment of the population. This pattern was set in the eighteenth century when huge tracts of land were given to political favorites.

These large estates were often cleared of forest and made into ranches and plantations. The land appeared to be fertile, and landowners were convinced they could make large profits. European agricultural methods transferred to Amazonia often failed. But, developers saw that natural forest products could be collected and sold for export. Unfortunately for the rain forest dwellers, the flow of goods, and therefore money, was unbalanced. Most of it went in only one direction: out of the Amazon (Hecht and Cockburn 1990).

Most of the trade in the region depended on foreign consumers and investors. Because raw materials were shipped out of the Amazon and processed somewhere else, there was little economic return to the Amazon region. Figure 5 below shows how one Amazonian export, rubber, moves from the rain forest toward manufacturers located outside of Brazil.

In this system, Amazonian rubber tappers traded their rubber for tools, clothing, and other supplies. The supplies came from trading



Figure 5 Flow chart of rubber exports from the Amazon basin.

- 1. What does the flow chart in Figure 5 tell you about the Amazonian economy?
- 2. In which regions or countries would you expect to find the manufacturers of rubber products from the Amazon?
- 3. Would you expect the flow chart to be similar if other resources such as wood, bauxite (ore of aluminum), or Brazil nuts were substituted for rubber?

CAN MANAGEMENT

posts where prices were grossly inflated. Rubber barons, merchants, and foreign investors made tremendous fortunes, while the forest people who gathered the products lived in poverty (Hecht and Cockburn 1990).

Even after political independence came to Latin America in the nineteenth century, the regional economy, including the separate economies of different Latin American nations, still depended on foreign manufacturers, consumers, and investors. Development in the Amazon region is dependent on many outside forces.

What are the visions of the rain forest today?

VISION ONE

The bus pulls away in a burst of exploding cylinders that push diesel smoke into the afternoon sky. The smoke rises with a thick red dust, churned from the exposed earth of yet another new road cut into the forest. Tropical heat burns the air. Dust settles. Green vegetation along the road turns powdery red. The hurriedly constructed shacks-housing landless newcomers drawn to a region with few people, pushed from a region with too many-are showered with another layer of the dry, red mist. Cooling sweat trickles through the dust caked on a woman's neck. On her head she balances a basket full of tortillas to sell to hungry bus passengers. The road has brought all these things: the dust, the shacks, the settlers. Next to the road, beyond the dust, is a field; fire-blackened tree trunks lie . . . on the red earth. A white, wide-brimmed hat affords shade for a man preparing his newly cleared land for a planting of corn and beans-and security and hope. Beyond him, in the distance, a wall of green forest seems to quiver in the heat above the open land, defying the expanding agricultural fields-if only until the next year. Above, the sun is a dull red-orange fire, filtered by the smoke of 6,000 patches of burning forest. In the dry season, the earth awaits rain.

VISION Two

A satellite passes over the agricultural frontier of a tropical region; a shutter opens and an image of a road and the deforested land it bisects enters a technological matrix of digitizers, electromagnetic waves, radars, and computers. Eventually a transposed two-dimensional image reappears in a lab on Earth. As a transparency, it is projected onto a large, pale-grey screen in an air-conditioned auditorium, where neatly dressed people, eager to record the image in their own way, write in notebooks. A speaker interprets the image of the road and the path of disturbed vegetation for miles on either side. The buses, the settlers, and the dust are not within resolution. The smoke, thousands of tiny, frozen plumes, makes the image hazy—as if the landscape seeks to obscure itself and resist interpretation. "Satellite imagery," states the lecturer, "suggests . . . extensive deforestation . . . many complex reasons . . . scientific implications of this are uncertain."

VISION THREE

The manager of a Danish-design furniture store is preparing for a big day. . . . From the back of the store, he notices a group of young people walk in. He takes them for college students-not the usual customers for expensive furniture made of tropical woods. Maybe they have wealthy parents. Suddenly, one of the students produces a piece of green paper, and begins to read. Her voice is forceful, demanding. "Tropical deforestation," the baffled manager hears, and then, "indigenous people," and "species extinction." Customers listen as the young woman describes the destruction [happening] to make the elegant furniture that fills the store. Her T-shirt reads, "The Rainforest. It is us; we are it. Let's save what remains." A mechanical scream from the front of the store draws the attention of the customers to a wild-eyed activist [holding] a roaring chainsaw, harmless without its chain, but clear in its meaning. He proceeds to mime the slaughter of the forest. Students representing the howler monkey, the toucan, and the mahogany tree all fall amidst the furniture. It is a die-in. "We will not leave until the destruction of tropical rain forests stops," says the woman to the manager. The manager wonders, "Should I call the police?"

VISION FOUR

The old ones [today's elder Amazonian Indians] teach an ancient lesson: The forest is the giver of all things. They teach as they were taught by those who came before them. The lesson reminds the people to walk barefoot and sit upon moist earth and know a mothering power. It reminds them why and how the forest rises from the earth, trees in every direction, a greenness broken only by great rivers, slow waters that flow to where they will again fall from the sky. The lesson is told through stories about the ancestors and their lives in the forest. The people know the stories are true. The stories are re-created each day with each fruit from the forest, with each sacred medicine from the forest, with each brilliant flickering of the firebug. The forest is all life (Heinzman 1990, pages 1–3).

- 4. These are just four of the many visions of the rain forest. Which vision gives us a view from within the forest itself?
- 5. Which vision is of the invasion of the forest?
- 6. Which are views from the outside looking in?
- 7. What are the internal or external forces affecting Amazonia?

How does development affect native peoples?

As was true in the past, one of the main visions of Amazonia is of a treasure trove. To the South American governments involved, its minerals and forest products are important national resources. Multinational businesses hope to share in its wealth. The Amazon is also perceived by local governments as an answer to internal problems: poverty, joblessness, and landlessness. In this view, the forest dwellers—native Indians and people of mixed Indian and Portuguese ancestry, called *caboclos*—are often seen as roadblocks to development of the area.

Many of the forest people are petty extractors, or collectors. Petty extraction is the gathering or collecting of forest products, such as Brazil nuts, palm hearts, and rubber. The common perception of for-



Forest dwellers are seen as roadblocks to development.

est peoples as obstructions to development has caused very serious, often violent, disputes. The forest people are commonly on one side; large landowners, miners, and developers are on the other. The disputes are usually over land that has been seized from the Indians, collectors, or colonists and turned over to ranchers or mining enterprises. In a four-year period between 1984 and 1988, the Catholic Church in Brazil recorded 533 assassinations over land disputes. Most of these were in Amazonia (World Resources Institute 1990a).

For example, 70 Yanomami Indians were massacred by gold miners in Roraima, Brazil in August, 1993:

The 70 victims, members of one of the least assimilated indigenous societies of the Amazon region, were shot, hacked to pieces, and burned in a remote forest near the Venezuelan border. It was only the latest attack on the Yanomami by gold miners who have been invading the territory since 1987.

Local politicians and business leaders had encouraged the invasion of the Yanomami reserve, and the massacre was the direct result. The invasions are in defiance of a two-year-old law establishing the boundaries of the Indians' territory (Turner 1993, page A21).

Much of Amazonia's development is agricultural. Land is cleared for cattle grazing. Food is grown for the increasing Brazilian population. With so many reasons for using the rain forest, it is ironic that these developments should imperil the very land on which so many depend (Figure 6 below).

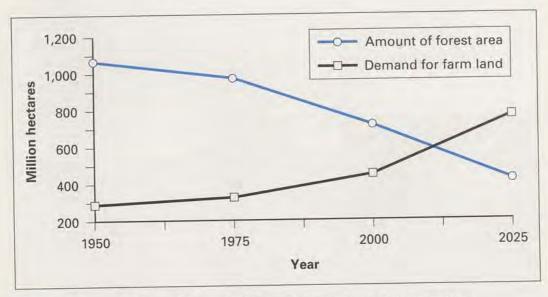


Figure 6 Total world tropical forest area lost and demand for farm land.

Reports have identified as many as 6,000 fires per day caused by clearing the rain forest. The present rate of destruction led to the loss of rain forest equal to the size of Texas from 1978–1992. At that rate of loss, there is enough rain forest left to last approximately 100 years (Fisher 1992). Recent studies show slower rates of deforestation (Monastersky 1993), but the rate is still alarming.

As suggested in Lesson 2, rain forest destruction without reforestation will cause increased soil erosion and further loss of forest and habitat. Habitat loss means plants and animals will have fewer places to live and less food to eat. As the number of organisms decrease, entire species will be threatened with extinction. Eventually, so many species would be lost that the entire ecosystem may collapse.

Another irony of species extinction is that humans depend on a wide variety of plants and animals for disease treatments and cures. There are more than 50,000 known plant species alone in Amazonia, or about one-fifth of all the world's plant species. The vast majority of species have not been analyzed for their medicinal benefit (Boehm and Swanson 1992).

What does species extinction in the Amazon mean? When we consider extinction, most of us imagine the loss of a species of plant or animal. It is harder to imagine the death of an entire group of human beings. And yet, more than a third of the Amazonian tribes that existed in 1900 no longer exist. Of the estimated 3 to 4 million Amazonian Indians alive when Columbus first arrived in America (Hemming 1978), only some 200,000 remain today.

Many hundreds of thousands of Amazonian Indians died of diseases common to Europeans, but for which the Indians lacked immunity (like measles, influenza, and smallpox). Even today, wherever roads are built into the Amazon, the Indians who live in those areas are at risk. Within one year of the construction of the Trans-Amazon highway, for instance, the Parakana Indians lost 45 percent of their population (Hecht and Cockburn 1990).

Can native cultures survive development?

The following words were spoken by Paiakan, a leader of the Kayapo Indian people of the Amazon region:

The forest is one big thing; it has people, animals, and plants. There is no point saving the animals if the forest is burned down; there is no point saving the forest if the people and animals who live in it are killed or driven away. The groups trying to save the race of animals cannot win if the people trying to save the forest lose; the people trying to save the Indians cannot win if either of the others lose; the groups cannot win without the help of the Indians, who know the forest and the animals and can tell what is happening to them. No one of us is strong enough to win alone;

together, we can be strong enough to win (Hecht and Cockburn 1990, page 217).

One idea of cultural survival is called "museum culture." A museum culture is one that is preserved for outsiders to look at and study. Effort is aimed at preserving visible cultural traditions, even though the living culture itself may deteriorate and eventually die.

An opposite perspective is called "twentieth-century culture." According to this view, whether a culture exists in New York City or the Peruvian rain forest, it must have both the freedom to make choices and information to base those choices on. If traditions are lost as a result of gaining entry into the twentieth century, then that is the price that must be paid.

Culture expresses "learned group experience" (Denevan 1983). As the group keeps learning, the group experience continues to grow and change. Is it possible that the indigenous cultures of Amazonia can change and survive? Consider this statement by an Amazonian Indian named Ailton Krenak:

For a long time only the anthropologists were able to get into the Indian areas and describe what was going on. Since the 1970s this has all changed. This is due to changes in the government policy itself. As they penetrated more deeply into Amazonia, any time they cut a road Indians would leap out of the way.



Indian man of the Amazon region.

Thousands of Indians would be running out of the way of bulldozers. People didn't realize that the area was full of Indians. Another factor is technological. The level of communication improved and people could hear what was going on and began to realize that all over the region Indian groups were experiencing the same problems. What began to happen was the emergence of a true indigenous voice. We had our own analysis and point of view that we ourselves could articulate. We didn't want to be represented only by anthropologists. Before the 1970s, few Indians were off the reservations, and an Indian off the reservation was a dead Indian. With the 1970s, Indians began to move into other parts of Brazil as Indians rather than half-breeds, and to participate as an autonomous political force, to send people down to Brasília (Hecht and Cockburn 1990, page 243).

- 8. Which concept of cultural survival—museum or twentieth century—do you think Ailton Krenak supports? Why?
- 9. What do you think Ailton Krenak would say about the three core values for development identified in Lesson 1 (page 5)?

Some of the forest peoples that have been fighting with each other for a century, like the Indians and the rubber tappers, have begun to come together. They are sharing their knowledge and experience and learning how to defend the forests and the rights of forest people. In 1987, the Forest Peoples' Alliance (Figure 7 on page 36) was formed (Hecht and Cockburn 1990).

The Alliance may help forest dwellers gain political power. The Alliance emphasizes that development plans should be based on the culture and traditions of forest dwellers (Hecht and Cockburn 1990). It also affirms basic human rights, including the rights of forest people to participate in their own development and the development of the rain forests. And it demands an end to the violence that has been practiced for centuries against forest people.

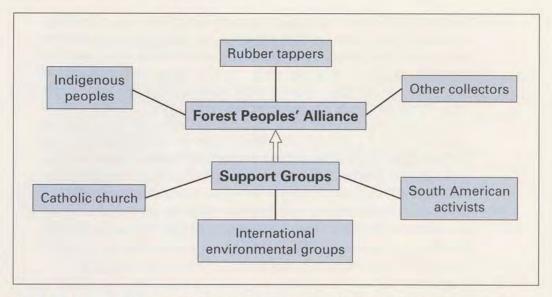


Figure 7 Structure of the Forest People's Alliance of Brazil, established in 1987.

Source: Hecht and Cockburn 1990.

- 10. What are some of the threats that are currently facing Amazonian cultures?
- 11. Do you think the Amazon Indians eventually will become part of the larger national cultures that surround them? Why or why not?
- 12. Do you think development is a key to Indian cultural survival, or will it doom Indian cultures to extinction? Why?



Is sustainable development likely in the Amazon?

Objectives

In this lesson, you will

- Understand the idea of sustainable development.
- Analyze and evaluate the sustainability of some activities in Amazonia.
- Consider the likelihood of sustainable development in the Amazon.

Glossary Words

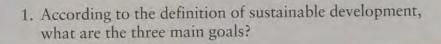
developed country development extractive reserve seringueiros

What is sustainable development?

In 1983 the United Nations created The World Commission on Environment and Development. Their task was to seek an answer to this question: How can people today and in the future enjoy a better quality of life while still protecting the quality of the environment (MacNeill 1989)?

During its work, the commission pulled in evidence from almost a thousand experts, political leaders, and concerned citizens from five continents (MacNeill 1989). At the end of three years, this commission reported that the hope for the future of our planet lies in "sustainable development."

Sustainability is the [idea] that economic growth and development must take place, and be maintained . . . within the limits set by ecology . . —by the interrelations of human beings and . . . the biosphere, . . . [also,] the spread of a reasonable level of prosperity and security to the less developed nations is essential to protecting ecological balance and hence essential to the continued prosperity of the wealthy nations. It follows that environmental protection and economic development are complementary rather than antagonistic processes (Ruckelshaus 1989, page 167).



Is sustainable development taking place in the Amazon?

The legend of Johnny Appleseed could have been about a Kayapo Indian in the Amazon. The Kayapo not only plant useful species, they reforest open grassland areas and shift plants to locations they can reach more easily. They have collected seeds over an area about the size of Western Europe and planted them in locations of interest to them (Hecht and Cockburn 1990). Even after they leave an area, the Kayapo continue to visit and maintain their agricultural sites. These forest uses are practiced by many other Indian groups as well. In fact, scientists suspect that much of the Amazon has been managed, on a sustainable basis, by native peoples for *thousands* of years.

The Amazonian Indians aren't the only forest people. Many rain forest products are harvested by petty extractors (small-scale collectors). One of the most important of these products is rubber.

Rubber tappers (called *seringueiros*) gather latex from rubber trees that grow naturally in the forest. Rubber trees occur at a distance of about a hundred yards apart, so harvesting rubber involves a lot of walking. The paths used by tappers to collect rubber are called *estradas*. Figure 8 on page 39 shows estradas where natural rubber groves are claimed for the exclusive use of the landowner.

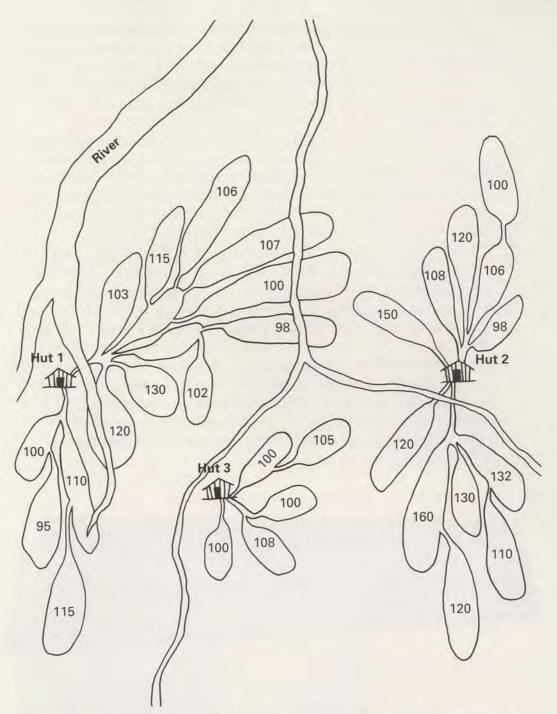


Figure 8 Map of estradas, modified from a 1911 drawing. The estradas were the looping paths around the rubber trees. The numbers inside the loops show how many trees were reached by that estrada. Also shown is the location of three huts where the tappers lived. Hut 1 housed seven tappers, who worked 15 estradas; Hut 2 had six tappers for 12 estradas; Hut 3 had two tappers for five estradas.

The rubber tappers use a knife to make cuts in the bark, but these cuts don't kill the trees. Latex drips into a cup that is fastened underneath the cuts. The tappers make their rounds of all the trees in their estradas, cutting the bark, and then return a few hours later to collect the latex. They dry the latex over a smoking fire, and form it into large balls.

Most forest collectors hold several kinds of jobs. They often work as agricultural laborers, usually as sharecroppers on someone else's land. They sometimes work as day laborers for pay. They often collect many different forest products, like Brazil nuts, palm hearts, babbasu nuts, and rubber, so if the price of one drops they still have economic security in the others (Hecht and Cockburn 1990).

Most rural families in the Amazon support themselves, at least in part, by forest collecting. Recent studies have shown that if environmental costs are counted in the price of turning forested land into other uses (like ranching and farming), extraction is more economical (Hecht and Cockburn 1990). One study of the market value of fruits, cocoa, and rubber from Peru's Amazon forest turned up some surprising information. The study showed that, over time, earnings from forest products collected from one hectare (2.47 acres) of land was about six times the amount that could be made by harvesting and selling all the timber on it in one year. It was also about twice the value of converting the land to cattle pasture (World Resources Institute 1990b).

2. Do you think that forest collecting is a form of sustainable development? Why or why not?

No one knows for sure how many seringueiros now live in the forest—estimates range from 70,000 to 300,000. Unlike the Indians who live in social groups, rubber tappers live a lonely life dispersed through the forest. There is evidence from some parts of the Amazon that rubber tappers are leaving the forest to live in large towns and cities where life is less lonely and perhaps offers more opportunity. One former rubber tapper said:

The life of a seringueiro is the most suffocating life you can have. He fights and fights and fights and has nothing. His hands are full of smoke (Parfit 1989, page 64).

Another said:

A seringueiro has no future. He only works to make others rich (Parfit 1989, page 65).

Regarding the life of rubber tappers, the author Michael Parfit reported that:

It [is] a desperate existence. You go out on the estrada long before dawn, your bare feet shuffling among leaves and snakes, your way lighted by a smudge of light from a kerosene lamp. . . . All day you cut trees and gather latex while bugs pierce you and gather blood. Then you come home and must smoke or press the latex; you have made \$3. If you work hard you can cut 1,100 pounds of rubber during the dry season and earn 23 cents a pound. In the wet season, in some parts of the Amazon, you can harvest Brazil nuts for several hundred dollars more, or cut down occasional trees for sawmills (Parfit 1989, page 65).

Brazilian government support for the Amazon rubber tappers has declined. One reason is that Brazil's rubber industry is turning to plantations on the coast between Rio de Janeiro and the mouth of the Amazon. In the late 1980s a Michelin Tire Corporation plantation in Ituberá employed 1,550 workers who produced 3,000 tons of rubber per year. It would take about 6,000 seringueiros in the forest to make that much rubber.

Plantation rubber is cleaner and stronger than forest-collected rubber, so it brings a higher price. More and more of Brazil's rubber production is coming from plantations, an estimated 60 percent by 1991 (Parfit 1989).



Tapping a rubber tree.

What is the role of extractive reserves?

One idea for development in the rain forest has come from the rubber tappers' movement in Brazil. This is the idea of extractive reserves, something like parks with people living in them by collecting forest products.

Seringueiros could collect without fear that farmers or ranchers or miners would destroy the forest. Twelve extractive reserves are planned, one of which covers more than 2 million hectares (Parfit

1989).

In extractive reserves, individual families have use rights, but nobody owns privately. The land is leased from the state collectively by the people who live there and manage it. Once the legal rights of the people are assured, the extractive reserves might organize health care facilities, schools, and small-scale manufacturing (Hecht and Cockburn 1990).

The land would be managed based on a sustainable extractive economy. Some conservationists in developed countries believe there is great potential for extractive reserves. The Environmental Defense Fund, the World Wildlife Fund, and the National Wildlife Federation have focused international attention on the rubber tappers' organization and its work in the Amazon (Hecht and Cockburn 1990).

In 1987, Chico Mendes, one of the organizers of the rubber tappers' union, was awarded a major international prize for his work on behalf of his people and the rain forest environment. In the following year, 1988, he was murdered (Hecht and Cockburn 1990). His murder gives some idea of the tremendous opposition to the idea of extractive reserves.

Organizers of the forest people have attracted the same sort of violence that has been associated with land disputes all over the Amazon. But the murder of Chico Mendes caught the attention and sympathy of many people around the world. Under the eye of the global community, the forest people of Amazonia have begun to organize and declare their rights as users and managers of the rain forest. The Brazilian government has formed an agency to develop extractive reserves.

In order to preserve the Amazon rain forest, groups in developed nations have proposed turning large sections of the forest into national parks. To this suggestion, Arturo Gómez-Pompa, a Mexican ecologist, responded:

We can no longer earmark an area as a "Nature Reserve: Keep Out" and have it policed, while multitudes of starving peasants in the vicinity are looking for a suitable spot to plant next season's crop. This colonialist approach to conservation is doomed to failure (Nations 1990, page 214).

- 3. What do you think is the potential for the success of extractive reserves in the Amazon?
- 4. To what extent do you think extractive reserves will assure sustainable development?

Whose rain forest is it anyway?



Figure 9 Environmental issues look different to people and governments in rich and poor countries.

Many South American politicians and private citizens think that organizations in the developed world pressure them unfairly, especially when the developed world is saying, "Do as I say, not as I do." For example, over a period of 300 years (between 1630 and 1930), a half-million square miles of forest were cleared in the United States (World Resources Institute 1990b). Although deforestation may be happening faster now in South America, people there argue that they should have the same rights to use their resources that North Americans had to use theirs (Figures 9 and 10 on page 43 and below). In 1989, in response to critics of rain forest destruction in Brazil, President Sarney of Brazil ended a speech by saying: "Brazil controls the Amazon, the Amazon is ours" (New York Times 1989).

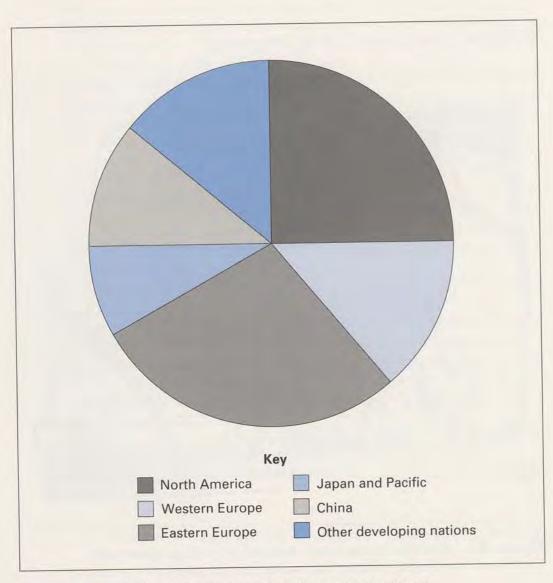


Figure 10 Industrial emission of carbon dioxide, 1985.

- 5. What situation does the cartoon in Figure 9 describe?
- 6. What symbols do you find in the cartoon? Looking at the cartoon more carefully, what other points do you think the artist was trying to make?
- 7. Is there a relationship between the cartoon in Figure 9 and the pie diagram in Figure 10? If so, what is it?
- 8. Carbon dioxide is emitted into the atmosphere both by burning fossil fuels and by deforestation. If people in developed countries use a lot of fossil fuels, do you think it is fair for them to try to stop tropical deforestation?
- 9. Do you think that Amazon development will continue to be environmentally destructive or do you think it will become sustainable? Why?



What environmental problems has development caused in Eastern Europe?

Objectives

In this lesson, you will

- Understand the nature of central planning and a command economy.
- Link environmental pollution to the problems of central planning.
- Predict the future of Eastern European development after departure of Soviet control.

Glossary Words

central planning command economy development nongovernmental organization (NGO)

What has been the nature of development in Eastern Europe?

You now turn your attention to development in a different region—Eastern Europe. Even though the place is different than the Amazon, some of the same problems have occurred. The following is a famous quote from the former leader of the Soviet Union.

About the capitalist states, it doesn't depend on you whether or not we exist. If you don't like us, don't accept our invitations, and don't invite us to come and see you. Whether you like it or not, history is on our side. We will bury you.

—Nikita Khrushchev, former Premier and General Secretary of the USSR, November 1956 (Bartlett 1968)

Nikita Khrushchev expressed the desire of many former Soviet communist leaders to catch up to and surpass levels of development in capitalist North America and Western Europe. His dream of burying the West in a flood of industrial production never came to pass.

In communist countries, all economic decisions were made by a central planning committee. The committee devised five-year plans for development. All wages, prices, and production goals were controlled by the committee. No one was allowed to own land or labor; the state owned all resources. Such a system is also referred to as a command economy.

New factories and power stations arose near the growing Eastern European urban areas. Emphasis was placed on heavy manufacturing and electrical production. Environmental concerns were neglected in the quest for greater production. And without democracy and freedom of expression, environmental concerns were suppressed rather than openly debated.

How has development changed Poland's environment?

In 1985, the Polish Academy of Sciences described Poland . . . as the most polluted country in the world. At least one-third of the country's people are likely to acquire environmentally induced cancers, respiratory illnesses, and a host of other diseases (Miller 1992).

Poland embarked on a program of rapid industrial development following World War II. First, power stations had to go into operation. Poland's large coal reserves seemed the best way to deliver low-cost power.

To save money, few pollution-control devices were used on the coal-burning smokestacks. In the communist society, public protest was suppressed. Air pollution is so heavy in some Polish cities that drivers must turn on their headlights during the day.

Deforestation caused by toxic air pollutants is now a serious problem. Some 15 percent of Poland's forests were lost by 1990 and another 82 percent were in danger (Miller 1992).

Soil, water, and farmland are threatened by air pollutants. In the Krakow area, 60 percent of the food grown there is unsafe to eat.

The average life span in Krakow is three to four years less than the national average. Figure 11 below compares life expectancy in Poland to other places in the world (World Resources Institute 1992).

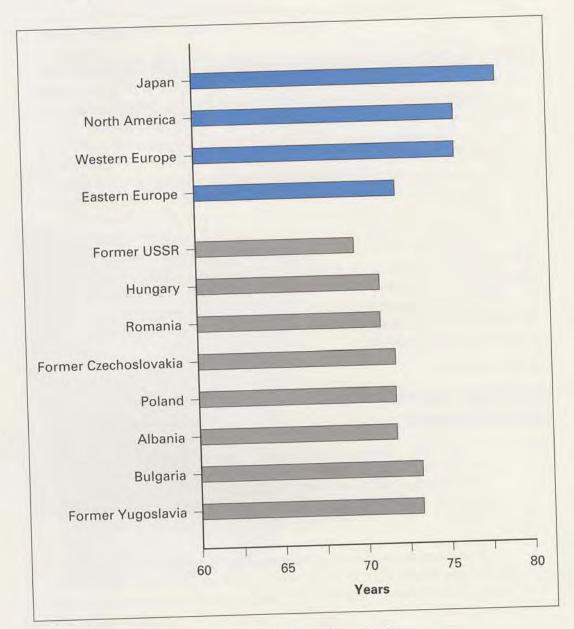


Figure 11 Life expectancy at birth, 1985–1990.

Source: World Resources Institute 1992.

Water pollution is so bad in Poland that 90 percent of river water is unsafe to use for drinking. In North America, nearly every city has a sewage treatment plant, but less than half of Polish cities have one. Even in Warsaw, the capital city, just 5 percent of sewage is treated. The remaining sewage gets dumped into the Vistula River.

- 1. Why might other European countries be concerned about Polish pollution?
- 2. Do you think pollution problems are similar in other East European countries? Why or why not?

What can be done to clean up Eastern Europe?

In the early 1970s Bulgaria protected many sites from the ill effects of industrial development. But this did little to clean up pollution in Bulgaria's heavily populated manufacturing regions.

Since the early 1980s, Bulgarian planners have taken pollution into account when considering development projects. But a lack of money and their need to profit from export markets makes it difficult to spend money on pollution controls (Dawson 1987).

In Poland, the end of communism brought new political freedoms. The new Polish Ecology Party tried to enact laws to protect the environment. There are now some 2,000 environmental organizations in Poland.

In 1990, Poland's new Minister of the Environment made public plans to begin cleaning up the country's 80 worst industrial polluters. But Poland will have to spend around \$20 billion over the next 15 years just to match the environmental conditions of Western Europe. Some of the cost will have to be paid by wealthier countries if Poland is to have a livable future (Miller 1992).

THE STRUGGLE OF A POLISH ENVIRONMENTAL REFORMER

Maria Stolzman is an environmental reformer who became a political leader. Her brown hair pulled back, and wearing a bulky sweater, she sits in her office in a Catholic Church building in Warsaw. She explains her progression from dissident to [parliament] deputy.

For years Stolzman worked as a researcher on animal genetics, rising through the ranks to the number-two job at her government-run agricultural institute. In 1982, she took on an extracurricular activity, helping to start an environmental organization aimed at, among other things, improving farm water systems. Only 27 percent of Polish villages have adequate water and, she says, every fifth village has to carry water, often from polluted sources.

Troubled that the organization was supporting private agriculture, the Polish government refused in 1986 to let it remain autonomous. No longer able to attract foreign funding, the organization collapsed. Meanwhile, Stolzman says, when she realized her activities had jeopardized the agricultural institute, she resigned.

Since the revolution ousting communist leaders, her standing has changed. Stolzman oversees a newly created private Foundation of Water Supply in Rural Areas. She was elected to [parliament] on the Solidarity ticket. Three of the other 12 founders of the original farm organization are also in the government.

The foundation takes money only from nongovernment sources, many of them outside the country. On the wall in her office is a map of the country, plastered with little yellow, red, green, and blue hearts showing projects in various stages of completion.

"Money is a limiting factor," Stolzman says of her problems in starting even more projects. But these obstacles are not stopping growth of public action groups. She says, "Now the numbers of NGOs [nongovernment organizations] are growing by the hundreds every month" (Hamilton 1992).

- 3. How can developed countries help Poland and other East European countries?
- 4. What are some of the major problems faced by Poland as it tries to clean up?
- 5. Do you think the new political systems of Eastern Europe can find environmental answers? Explain your answer.
- 6. Why do you think Maria Stolzman created a private foundation instead of a government-owned one?

DSINS/SOVERS



How has development affected the Tennessee valley?

Objectives

In this lesson, you will

- Evaluate statistical measures of development.
- Consider the long-term effects of a Depression-era government development project on a U.S. region.
- Evaluate whether TVAtype development should be done in other world regions.

Glossary Word

development

What is the TVA?

To close our study of the effects of development, we turn to the United States. This case study looks at a development project established by the U.S. government during the 1930s, the Tennessee Valley Authority (TVA).

Not only did the TVA lift the economic status and physical well-being of the people of the valley, but, perhaps more importantly, it lifted their spirits as high as the lofty mountains which majestically border the eastern rim (Callahan 1980).

The TVA was established during the Great Depression to promote regional development (Figure 12 on page 52).

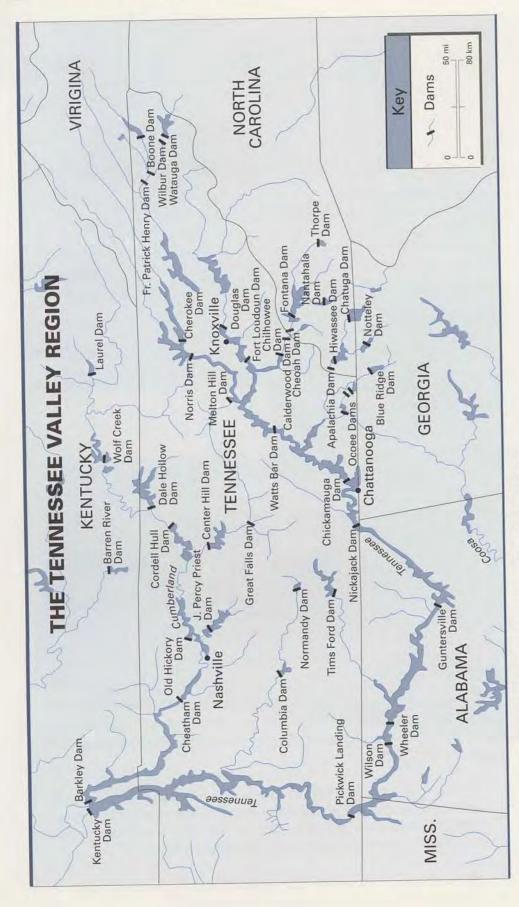


Figure 12 East-central United States and the TVA region.

Source: Birdsall and Florin 1992.

The TVA was granted the power to produce the cheap hydroelectricity needed to promote industrial growth. Farming could also expand by using land protected from flooding. In addition, fishing and boating was provided by the newly formed lakes.

Work by the TVA improved river navigation. It also helped an energy-intensive fertilizer industry to become a reality. Research and development of commercial nuclear power also came to the region (Birdsall and Florin 1992).

How well has the TVA worked?

The TVA was charged with responsibility for "the unified conservation and development of the resources of the Tennessee Valley" (Chandler 1984). Compare this statement with the goals of sustainable development from Lesson 5 on page 38.

The work of the TVA has been copied by other countries, notably, Mexico, China, and Brazil. Other development projects in the United States also use the TVA model. But how well has the TVA worked?

Measure of success

In Lesson 1, you saw that income can be used as a measure of development. Table 5 on page 54 shows how income grew over time spans of 9 and 50 years. Critics of the TVA say that the data confirm that the project has not increased development. Do you agree?



Through damming and flood control, the TVA tried to improve the life of the farmer.

Table 5 Growth in income per person (average percentage per year)

State/area	1934–1943	1929–1981
United States	9.5	5.2
Main TVA states		
Tennessee	10.9	6.0
Mississippi	11.2	6.3
Alabama	11.3	6.2
Kentucky	10.8	5.9
Non-TVA states		
Arkansas	10.9	6.3
Florida	10.5	5.7
Georgia	10.2	6.3
North Carolina	10.0	6.3
Virginia	9.6	6.2
Southeast U.S.	10.5	6.2

Source: Chandler 1984.

According to other data, the Tennessee valley grew slower than promised in manufacturing employment. It also has fewer homes with running water and electric appliances. The TVA promised more electrical service to the Tennessee valley, but this too came at a slower pace than in surrounding states.

Defenders of the TVA point to lower electricity rates as compared to the national average. The agricultural projects helped farmers maintain soil, reduce erosion, and increase yields through the use of fertilizer. It helped develop cleaner ways to burn coal. The TVA also developed nuclear reactors, and solar energy to heat water (Chandler 1984).

- 1. How does the quote at the beginning of the lesson compare to the views expressed by supporters and critics?
- 2. What other measures of development might you use to determine the success or failure of the TVA?
- 3. Do you see any similarities or differences between the TVA and government-run projects in the former USSR or Eastern Europe?
- 4. Would you recommend that other countries model development projects after the TVA? If not, what would you change? If so, what are its strong points?

Glossary

- Biodiversity An expression of the number of different species in a given ecosystem.
- Caboclos People of mixed Indian and Portuguese descent who live in the tropical rain forests of the Amazon.
- Central planning The means by which a command economy makes decisions.
- Command economy A governmentcontrolled set of decisions regarding production and consumption of goods and services.
- Developed country The wealthy, industrialized, and capitalistic countries of the world. Often synonymous with First World.
- Developing Country The poorer, often agrarian, countries of the world.

 Often synonymous with *Third World*.
- Development The general condition or level of wealth of a country. Also, the improvement of education, economic productivity, and health care leading to an increase in the well-being of the people.
- Ecosystem A community of plants and animals and its interactions with its physical environment.
- Extractive reserve A parcel of land in the rain forest, owned by the state, where people are legally guaranteed the right to live and collect forest products.

- Gross national product (GNP) The value of all goods and services produced by a country. When divided by the country's population, GNP per person can be used as an approximate measure of wealth or economic development.
- Leach The process of removing nutrients from the soil layer used by plants and depositing them to a depth below the root system.
- Nongovernmental organization (NGO) A group of people that shares common interests and goals, and that operates independently of any government to achieve those goals. Examples of NGOs include the World Wildlife Fund, Greenpeace, and Amnesty International.
- Oligarchy A form of government in which the power belongs to only a few people.
- Petty extraction The gathering of forest products without damage to the forest itself.
- Seringueiro A rubber tapper in the Brazilian Amazon region.

References

- Bartlett, John. 1968. Bartlett's Famous Quotations. Boston: Little, Brown.
- Birdsall, Stephen S., and Florin, John W. 1992. Regional Landscapes of the United States and Canada. New York: John Wiley and Sons.
- Boehm, Richard, and Swanson, James L. 1989. World Geography. Mission Hills, CA: Glencoe.
- Callahan, North. 1980. TVA: Bridge Over Troubled Water. South Brunswick, NJ: A. S. Barnes.
- Chandler, William U. 1984. The Myth of the TVA. Cambridge, MA: Ballinger.
- Corson, Walter H., editor. 1990. The Global Ecology Handbook: What You Can Do about the Environmental Crisis. Boston: Beacon Press.
- Cowell, Adrian. 1961. The Heart of the Forest. New York: Alfred A. Knopf.
- Dawson, Andrew H., editor. 1987. Planning in Eastern Europe. London: Croom Helm.
- Denevan, William M. 1983. Adaptation, variation, and cultural geography. Professional Geographer, 35: 399–406.
- Fisher, James S. 1992. Geography and Development. New York: Macmillan Publishing Company.
- Goulet, Denis. 1973. The Cruel Choice: A New Concept in the Theory of Development. New York: Atheneum.
- Hamilton, John Maxwell. 1991. Will pollution kill the revolution? Bulletin of the Atomic Scientists, June 1991: 12–18.
- Head, Suzanne, and Heinzman, Robert, editors. 1990. Lessons of the Rainforest. San Francisco: Sierra Club Books.
- Hecht, Susanna, and Cockburn, Alexander. 1990. The Fate of the Forest: Developers, Destroyers and Defenders of the Amazon. New York: HarperCollins Publishers.
- Heinzman, Robert. 1990. Visions of the rainforest. In Lessons of the Rainforest, edited by Suzanne Head and Robert Heinzman, page 110. San Francisco: Sierra Club Books.
- Hemming, J. 1978. Red Gold: The Conquest of the Brazilian Indians. Cambridge: Harvard University Press.
- Jackson, Robert M. 1992. Global Issues, 1992-1993. Guilford, CT: Dushkin.
- Lobb, C. Gary. 1993. Brazil. In Latin America and the Caribbean, a Systematic and Regional Survey, 2nd Edition, edited by Brian W. Blouet and Olwyn M. Blouet, 385. New York: John Wiley and Sons.
- MacNeill, Jim. 1989. Strategies for sustainable economic development. Scientific American, September: 155–165.
- Miller, G. Tyler. 1992. Living in the Environment. Belmont, California: Wadsworth Publishing.
- Monastersky, Richard. 1993. The deforestation debate: Estimates vary widely over the extent of forest loss. *Science News* 144(2), July 10: 26–27.

COUNTRIES OF THE WORLD



