Michigan State University
Fulbright-Hays Group Study Abroad 2009:
Nepal in the Contemporary World

Lesson Plan
from
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Credit: Chris Brown /Water 1st International

Title: *Safe and Sustained Water for Nepal*

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Subject Areas: The main focus is Science
with connections to Social Studies, English Language Arts

Grade Levels: 4-6

Length of Lesson: Seven, 50 minute class periods (Could be extended longer)

Summary/Overview:

Water is a basic necessity for life, yet many people in the world do not have easy to safe drinking water. In fact, approximately 1/6 of the world's population does not have access to safe drinking water. In addition, it is often women and girls who are the ones responsible for collecting the water. This often requires hours a day and over rugged terrain. Nepal is a prime example of this struggle to obtain drinking water. Nepal has one of the highest percentages of rural populations in the world, has vast differences in terrain, and is a developing country with approximately 1/3 of its population living below the poverty line.

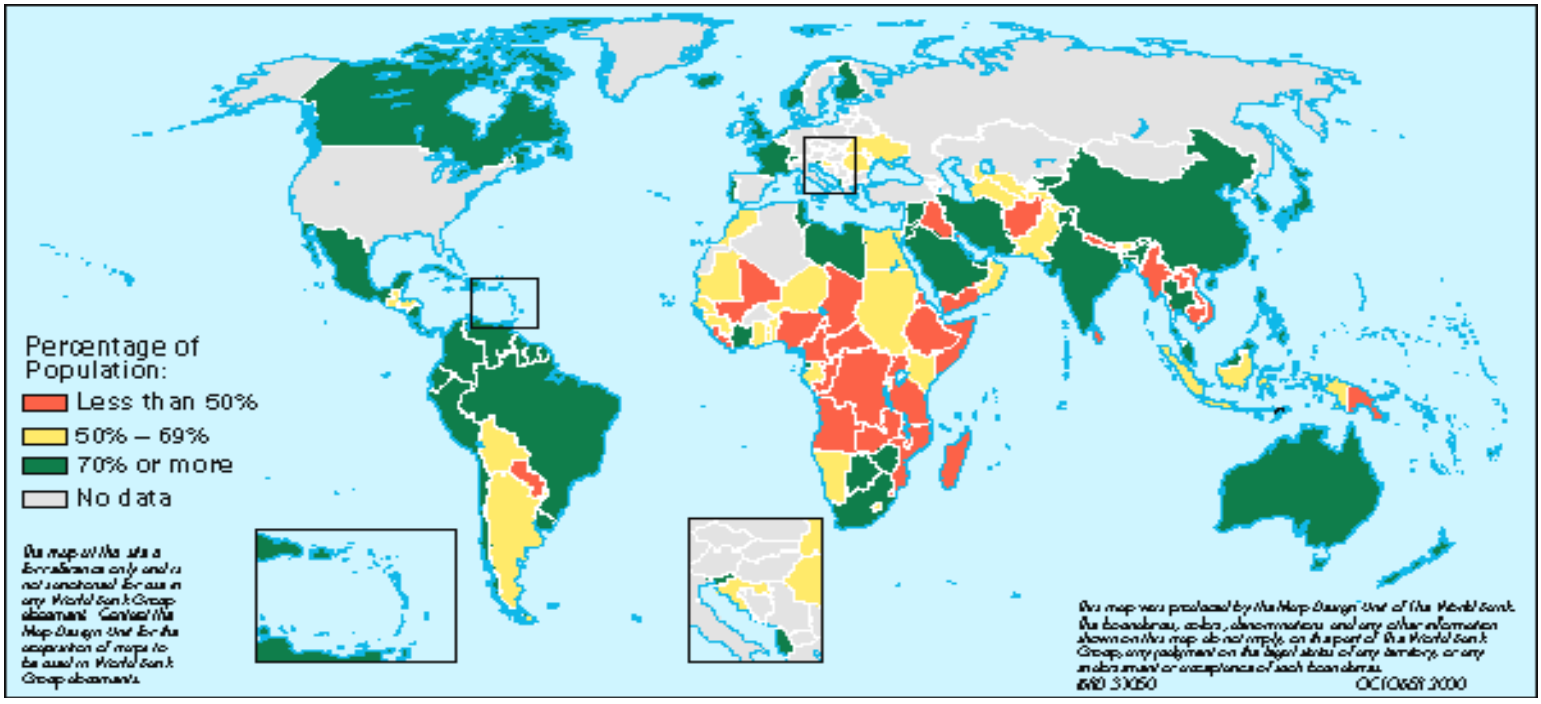
Primary Objectives:

Many Michigan students may not realize the blessings they have by having access to safe drinking water and sanitation. This mini unit helps them understand the needs people have regarding access to safe water by studying Nepal. This mini unit will assist student in becoming global citizens and stewards who are both aware and concerned about the challenges facing the great majority of the world's peoples. It will help students expand their knowledge about how geographic features influence land use. They will also understand the basic challenges facing families in low-income countries. Students will also gain knowledge of water conservation. Finally, students will write a position piece encouraging others to get involved.

Teacher Background:

- Recent data shows more than one billion people on Earth lack access to safe drinking water. Another caveat worth mentioning is an estimated two billion people lack access to sanitation. Most people lacking these basic needs live in low-income and/or developing countries. Nepal is one such country where many of its people need better access to both components.
- Each year, billions of people suffer from diseases and illnesses related to unsafe water. The young, the old, and the poor suffer the most from these water-borne diseases and illnesses (pathogen-bearing fecal matter can transmit cholera, diarrhea, typhoid, and parasites, etc.).
- Scarcity, inefficient use, and political discord (internal and external) all impact how people can obtain safe drinking water.
- Inadequate access to safe water and sanitation services, coupled with poor hygiene practices, kills and sickens thousands of children every day, and leads to impoverishment and diminished opportunities for thousands more.
- Poor sanitation, water, and hygiene have many other serious ramifications. Children – and particularly girls – are denied their right to education because their schools lack private and decent sanitation facilities. Women are forced to spend large parts of their day getting water.
- A UN study says 1.8 million children die annually from diarrhea that could have been prevented simply by having a clean place to go to the bathroom. The study also reports that roughly half of all people in developing countries have an illness related to sanitation and water quality.

Access to Safe Water, 1990-96



"Access to safe water is measured by the number of people who have a reasonable means of getting clean water, expressed as a percentage of the total population. It reflects the health of a country's people and the country's ability to collect, clean, and distribute water. Countries in which few people have access to safe water tend to be located in Africa and Asia. Countries in

which most people have access to safe water tend to be located in Europe, North America, and parts of Asia and South America." *World Bank Group*

Other Water Facts:

- While the human body can live for weeks without food, it can only survive a few days without water.
- Approximately billion people around the world do not have access to safe water.
- 220 million urban residents in the developing world lack a source of safe drinking water near their homes.
- Ninety percent of urban sewage in the developing world is discharged into rivers, lakes, and coastal water ways without any treatment.
- 25,000 people every day die from diseases caused by bad water supply.
- A quarter of the people in the world must carry water home by hand.
- The World Health Organization states that each of us need 20 liters (a little less than 5 gallons) of water a day for our basic needs. (Reasonable access to water is if water is available within 6/10 of a mile from our homes).
- Today an estimated 1.2 billion people drink unclean water, and about 2.5 billion lack proper toilets or sewerage systems. More than five million people die each year from water-related diseases such as cholera and dysentery.
- Agriculture consumes 60 to 80 percent of the fresh water resources in most countries, and as much as 90 percent in others.

Nepal Facts and Figures:

Data from Human Development Report 2008, Nepal for Water Health, the 2008 US Census and WHO

	Nepal	**United States**
Population	Approx. 30,000,000	Approx. 306,000,000
Life Expectancy	62.6 years	77.9 years
Adult Literacy Rate	53.8% (Male = 65.1% Female = 42.5%)	99%
Below Poverty Rate	30% (and 24% of these live on $1 US dollar a day)	12%
Average Income	*$270-$1000 US	*$44,000
Children who die before five years old	74/1000	8/1000
Telephones (land line)	17/1000	978/1000
Live in Rural Setting	85%	13%
Access to safe drinking water	**82%	99.2%
Access to indoor sanitation	30%	98.1%

*Data differed a lot on sites due to measures of ethnicity, education level, etc.

**In Nepal - 82 percent of population have access to safe and clean drinking water. Improved services such as piped water and covered wells make up for almost 93 percent of water coverage in urban areas and 79 percent in rural areas (with 6.7 percent water piped to the house, 32.5 outside the house and 39.6 percent using covered wells). The remaining must depend upon the conventional sources like unsafe wells, lakes, rivers, springs, etc.

Capital: Kathmandu
Land area: 56,827 square miles (similar size as Iowa or Illinois)
Population: 30 million (2008) (Both Iowa and Illinois have less than 13 million people in each state).
Three main geographic areas: mountains (Himalayas), high hilly areas (called the Middle Hills) and lowland tropical region (called the Terai).
Elevations: 500 feet to above 29,000 in only 120 miles
Climate: ranges from cool summers and severe winters at high altitude (in the north)

to sub-tropical in the southern low altitude areas.
Religions: Hinduism (81%) Buddhism (11%) Muslim (4%) Others (4%) (2001 Census Data)

Required Resources/Materials:

- Computer with Internet Access
- Paper, pencils, colored pencils, poster board, construction paper
- Clean/rinsed gallon milk jugs and/or water vessels (camping jugs, etc.)
- Various broom stick-type handles and rope
- OTIONAL MATERIALS:
    - Doko and namlo,
    - *I, Doko, The Tale of the Basket* by Ed Young
    - Addendum B: Article for discussion
    - Addendum C: Nepalese PSA Picture

Procedure:

Days One-Two:

- Ask students to bring in empty and clean gallon milk jugs or other large water bottles/containers for use later in the week.
- Introduce "Namaste" to the students and ask a student to find Nepal on a world map.
- Record any ideas and questions the students have about Nepal on chart paper using "Think-Puzzle-Explore" model.
- Split students into small groups with access to computers, books and other resources.
- Students research the terrain, elevations, and climate of Nepal and Michigan. Those done early can branch out into other aspects (i.e.: population, imports and exports, etc.)

Days Three-Four:

- Students make a visual representation comparing at least one aspect of Nepal and Michigan (Poster, power point, Venn Diagram, etc.)
- Students do a "Gallery Walk" to view all of the representations.
- Summarize and discuss findings.
- Revisit "Think-Puzzle-Explore" chart

Day Five:

- OPTIONAL ACTIVITY: Hold up the doko and namlo.
- Ask What Am I?
    - What do you think these objects are used for?
    - Who do you think uses them?
    - Do these objects tell us anything about the resources that are available in the country where it was made?
    - Do they tell anything about what is important to the user?
    - Were they machine or hand made? How can you tell?
    - Do you think all of the people in a country would use it?
- Set up the idea of availability of drinking water.
  Ask questions such as:

- Why do we need water?
- How do we use water?
- How/Where to we get our water?
- How do you define "safe" drinking water?
- How/Why is our water treated?
- How available is safe drinking water to people in the US? Other countries?
- OPTIONAL - THEN ASK: How could I carry these jugs of water using only the basket – called a doko, and this strap – called a namlo?

- Lead the discussion into availability of water in Nepal.
  - Discussion Topics: Himalayas, monsoon and problems with getting water to where it is needed, irrigation /agriculture.
  - Most water in Nepal is carried by hand and this is mostly done by women and girls who spend on average two hours a day getting water.
  - "Pani" is the Nepali word for water.
- Explain the homework "Water Use – How I Use Water" (*See Addendum A*)

Day Six: Carry water

- Teacher records as students share their results from "Water Use-How I Use Water".
- Discuss results. Americans average 150 gallons of water used each day *per person*. A gallon of water weighs just over 8 pounds.
- Put students into small groups and give each group milk jugs full of water. (Try to have at least 3 gallons per group.)
- Students must then devise methods and have one person carry all of the water (without spilling any) a distance of 100 yards. (Have rope and broom handles available.)
- OPTIONAL: Have each student carry loads of water up and down a ladder with doko and namlo. Ask students s go up three times carrying 3 gallons of water.

Day Seven *onward*…: Pay it Forward

- Have students develop a project to help those in need
- IDEAS: Letter writing campaign, Fundraiser, Public Service Announcements, Pen Pal Program, etc.
- Students can "Explore" any Puzzles/I Wonders they may still have from the "Think-Puzzle-Explore" chart

Picture by: Karen Nelson Patan, Kathmandu, Nepal June 2009

Credit: WaterAid / Marco Betti

Credit: WaterAid / Caroline Penn

Picture By: Karen Nelson Hamsapur, Nepal June 2009

Picture By: Karen Nelson Patan, Kathmandu, Nepal June 2009

Picture by: Karen Nelson Hamsapur, Nepal June 2009

Picture By: Karen Nelson Bhaktapur, Kathmandu, Nepal

Picture By: Karen Nelson, SOS Rambuzar School, Pohkara, Nepal July 2009

Credit: Chris Brown/Water 1st International

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Extension Ideas:

- How far is Kathmandu from where you live? Using maps, travel guides, or other resources, find out how you could get there and how long it would take for you to travel there.
- Using what you know about Nepal and its people design a flag that you think represents the country. Explain why you chose the colors, images and design that you did for the flag.
- Draw a contour map of Nepal showing the major rivers and cities.
- Find the names of the eight highest peaks in Nepal and what they are called in Nepali. What do these names mean in English?
- Find out how the monsoon affects agriculture, life and schooling in Nepal.
- Research the caste system in Nepal. What are some of the castes?
- Research some of the ethnic group in Nepal (There are about 100 of them!) Which one do you find interesting?
- Research the Constitution development process in Nepal. What do you think is the most important item in it to date?

If we could shrink the Earth's human population to a village of exactly 100 people, it would look like this:

The village would be made up of 60 Asians, 12 Europeans, 13 Africans and 9 people from Latin America and 6 from North America and the Caribbean. Sixty-seven people would not be Christian. Six people would control half of the entire wealth of the world. Four of these would be from the US and two from Europe. Forty people would not have access to safe water and sanitation. Seventeen of the adults would not be able to read; 13 would suffer from not having enough nutritious food; 60 would live in substandard housing and only 2 would have a college education.

Assessments:

- Have students write a persuasive/position piece expressing the need for safe water for everyone. Use the TCAPS Writing Rubric for assessing the writing.

Michigan Content Expectations Met:

- **4th Grade:**
  - **Science:** S.IP.04.11, S.IA.04.12, S.IA.04.13, S.IA.04.14, S.RS.04.11, S.RS.04.15
  - **Social Studies:** 4-P4.2.1, 4-P4.2.2
  - **ELA:** R.CM.04.01, R.MT.04.02, W.GN.04.04
- **5th Grade:**
  - **Science:** S.IP.05.12, S.IA.05.12, S.IA.05.13, S.IA.05.15, S.RS.05.11, S.RS.05.15
  - **Social Studies:** 5-P4.2.1, 5-P4.2.2
  - **ELA:** R.CM.05.01, R.MT.05.01, W.GN.05.03, W.GN.05.04
- **6th Grade:**
  - **Science:** S.IP.06.11, S.IA.06.12, S.IA.06.13, S.IA.06.15, S.RS.06.11, S.RS.06.15, L.EC.M.4
  - **Social Studies:** 6-P4.2.1, 6-P4.2.2, 6-P4.2.3
  - **ELA:** R.CM.06.01, W.GN.06.02

Bibliography Unique to this lesson:

SODIS: Program Office Website http://www.sodis.ch/index.html
The World's Water: www.worldwater.org
Safe Water: www.cdc.gov/safewater
World Health Organization: www.who.int/
Water in Nepal: www.newah.org.np/drinkingwater.htm
Nepal for Water Health: http://www.newah.org.np/
Water Science for Schools: www.ga.water.usgs.gov/edu
Oxfam site for Children and Teachers: www.oxfam.org.uk/coolplanet
United Mission to Nepal: www.umn.org.np
Water Aid: www.wateraid.org/uk/
Water First International: www.water1st.org/
Human Development Report: http://hdrstats.undp.org/countries/data_sheets/cty_ds_NPL.html
United Nations World Food Programme: http://wfp.org
Nepal Country Health Profile : Health and Environment: http://www.searo.who.int/
World Bank Group: http://www.worldbank.org/depweb
China View News: http://news.xinhuanet.com/english/2009-02/17/content_10832928.htm
Resource Centre Network Nepal (RCNN): http://www.nepal.watsan.net/page/398
Poverty News Blog: http://povertynewsblog.blogspot.com/2008/01/access-to-sanitationwidening-gap-in.html
UNICEF: http://www.unicef.org
United States Census and Housing Report 2008: www.census.gov

THANKY-YOU to *World Bank Group, WaterAid,* and *Water 1st International* for their willingness to allow me to use maps and photographs from their archives.

Addendum A

Water Use - How I Use Water

NAME: **Date:**

Directions: Record the activities in which you use water from the time you leave class today until the time you return to class tomorrow. Use the list below for help estimating how much water you used. Record your entire family's data for a better idea of how much water is used in your house for part of a day.

Average Amount of Total Water Used
[in gallons]

Washing hands 0.25 gallons
Brushing teeth 1 gallon
Flushing toilet 5 gallons
Drinking and eating 0.5 gallon
Laundry (per load) 30 gallons
Showering 30 gallons
Taking a bath 40 gallons
Washing car 20 gallons
Washing dishes (by hand, with water running) 10 gallons
Washing dishes (by machine) 15 gallons
Watering lawn (30 minutes) 240 gallons

Activity	Approximately how much water was used (in gallons)

Grand Total of gallons used: _____

Addendum B

Interesting News Article you may wish to have student use and discuss.

Nepali girls dropping out of schools due to lack of toilets

www.chinaview.cn 2009-02-17 11:52:27

KATHMANDU, Feb. 17 (Xinhua) -- Lack of proper and safe toilets in school premises is one of the reasons for Nepali girl students' dropping out before reaching the secondary level education, local newspaper The Rising Nepal reported Tuesday.

According to surveys on water and sanitation (WATSAN) carried out by government and private organizations and UN HABITAT Water for Asian Cities Program Nepal, 59 percent of public and community schools across the country do not have any toilet, contributing to the increasing rate of girl dropouts per year.

The rate of girl dropouts has increased by 6 percent in the span on seven years. The dropout rate in 2001 was 6.5 percent while it rose to 12.5 in 2007, a government report showed.

The report stated that although 148,000 toilets are constructed annually in the country, only 10 percent poor people have access to toilets. Similarly, 13,000 children under the age of five die annually because of water-borne diseases like diarrhea, cholera which are caused mainly by poor sanitation and hygiene.

Kamal Adhikari, an official at the Environmental and Sanitation Section under the Department of Water Supply and Sewerage said that the supply of clean water to the people was still a difficult task as the gap between safe drinking water and sanitation was quite large.

"Meeting the target for sanitation is a major challenge to Nepal," Adhikari said while giving orientation to about 30 media persons presenting 25 different media houses on Sunday.

As per Millenium Development Goal (MDG) the proportion of people without sustainable access to safe drinking water and basic sanitation should be reduced by halve by 2015. MDG Goal for water supply and safe drinking and sanitation both should be reached up to 90 percent by the end of 2015.

Adhikari said that 54 percent of the population in Nepal still defecate in open spaces. As a result the rich people living at Kathmandu and outer parts of the valley who do have modern facility of safe drinking water and sanitation were directly or indirectly affected due to contaminated, unhygienic drinking water, he said.

Rajesh Manandhar, water and sanitation coordinator of Water for Asian Cities Program-Nepal claimed that even after reaching MDG on sanitation, 1.8 billion people of the world would still be without access to basic sanitation in world.

Addendum C

Public Safety Announcement From Nepal Water for Health *website*