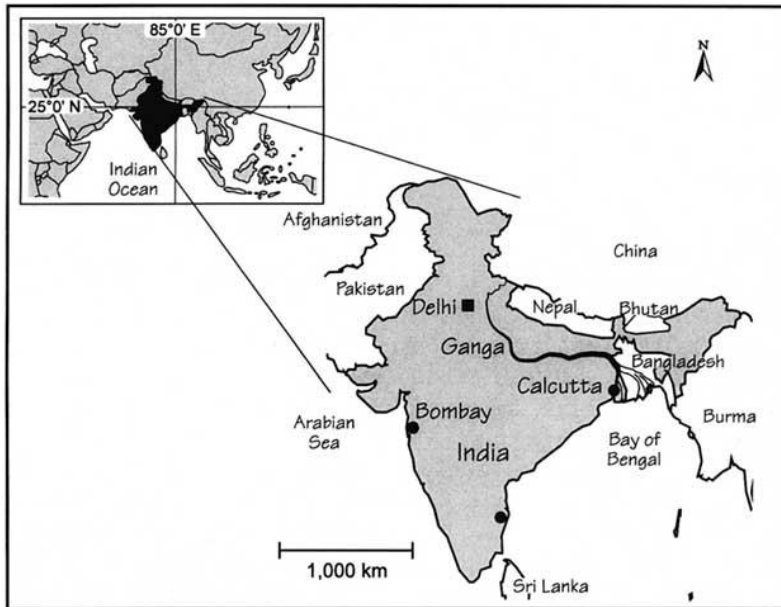


Connection: Water Stories Around the World

Teaching the LifeStraw: Student Activities

Although the river water in Luis's neighborhood is highly polluted, he is fortunate to drink from and bathe in filtered, piped water. In cities around the world, particularly in Asia, citizens have no choice but to bathe in and drink from foul rivers, such as the Ganges in India. Have students observe photos of the Ganges River, and discuss how the experience of those living near the Ganges might differ from those living by the Bronx River.



"The Ganga, especially, is the river of India beloved of her people, round which are intertwined her memories, her hopes and her fears, her songs of triumph, her victories and her defeats. She has been a symbol of India's age long culture and civilization, ever-changing, ever flowing and yet ever the same Ganga." Jawaharlal Nehru, the first Prime Minister of India, 1889 - 1964

Nearly 70% of all the water available in India is polluted. And much of that water is found in the Ganges River. The Ganges or Ganga is one of the major rivers of the Indian subcontinent, flowing east through northern India, Nepal and into Bangladesh. The 2,525 km (1,569 mi) river rises in the western

©1997 WHO/UNEP ISBN 0 419 22910 8¹
http://www.who.int/water_sanitation_health/resourcesquality/wpcase_study1.pdf

Himalayas in the Uttarakhand state of India, and drains into the Bay of Bengal. The Ganges begins at the Gangotri Glacier in the Indian state of Uttarakhand, in the central Himalayas, a glacier that experts say is shrinking at an alarming rate. As many people live along the Ganges delta as live in all of Europe; it flows through 29 cities (with population over 100,000), 70 towns and thousands of villages. About 400 million people- almost one-third of the country's population- live in the Ganges river basin, and the river provides water for 40 percent of India's population. (<http://www.ens-newswire.com/ens/may2012/2012-05-07-02.html>).

The Ganges is considered a holy river by the Hindus, and is worshiped as the goddess Ganga. More than 80 percent of Indians are followers of Hinduism, and they believe the Ganges has the power to cleanse the soul, so they perform ritualistic bathing in its waters twice a day. In addition, many Indians live and work by the river, bathing, drinking, swimming, and laundering



clothes. Author Santha Rama Rau states:

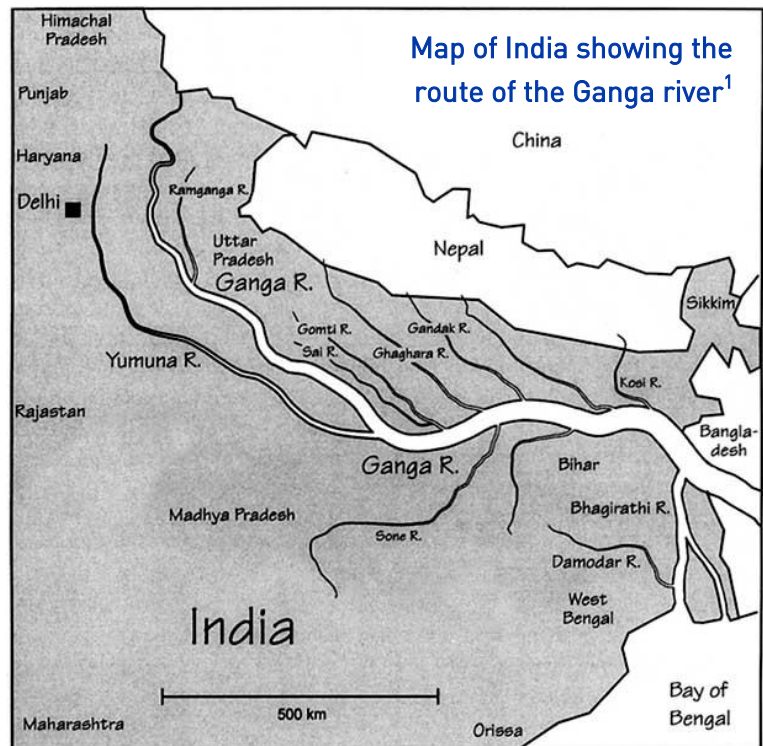
"There are beggars, idlers, vendors, touts, the young, the old, the curious, the remote, the talkers, the guides, the priests, the families simply out for a stroll, the ascetics, the crippled, the woman scrubbing out household pots and pans, the toughs, the gently curious ones. All are there along the Ganges" (Rau 244).

Hindus also believe the Ganges is the literal pathway to heaven, the "world of the ancestors." Because of this belief, ashes of the dead and corpses alike are thrown into the river, combining life and death in the same waters.

Just as the Ganges is one of the most sacred rivers in the world, it is also considered to be one of the most polluted. As India's population has exploded, so has the waste it creates – and much of that waste is finding its way into the beloved river. The World Health Organization estimates that as much as 1.1 million liters of raw sewage are dumped into the Ganges River every minute, carrying with it parasites, bacteria and viruses. Because such a huge number of India's population is poor, many don't have access to sanitation. Less than 50 percent of households have toilets. Sewage in the Ganges is joined by discharge from India's numerous tanneries, toxic medical waste, farmland runoff carrying chemical fertilizers and pesticides, residue from illegal mining, and the trash of many, many millions of people who live and work and recreate by its shores. Tragically, a sip of the river that many believe will purify the soul, can also kill the body.

"Polluted river water is the biggest cause of skin problems, disabilities and high infant mortality rates," says Suresh Babu, deputy coordinator of the River Pollution Campaign at the Center for Science and the Environment, a watchdog group in New Delhi, India's capital. (*A Prayer for the Ganges* by Joshua Hammer). A stretch of the Yamuna, the Ganga's main tributary, has been empty of aquatic life for at least a decade because the pollution does not allow any life forms to thrive in the water.

The World Bank is lending the Indian government \$1.5 billion to help clean the river, but the Ganges is 10 times the length of England's Thames river (BBC), travels through multiple municipalities, and is used by major industries as their dumping ground – adding logistical and political hurdles in a country known for corruption. To its credit, the Indian government formed the national Ganga River Basin Authority to begin to plan the daunting task of cleaning the river. However, the group has been plagued with conflict, and prominent members have resigned in protest, saying India's government needs to do much, much more. Critics believe without systemic change – industrial regulations, a comprehensive water and sanitation system, enforceable laws against pollution, and a widespread, effective solid waste transfer method – any clean-up of the famous river would be short-term.



QUESTIONS:

1. Click on the below link and review the Ganges river photos.
<https://www.google.com/search?q=potos+of+Ganges+pollution&hl=en&client=firefox-a&hs=MjE&rls=org.mozilla:en-US:official&prmd=imvns&tbo=u&source=univ&sa=X&ei=ZdSqT7-cJ4We8gT614S7Bw&ved=0CFAQsAQ&biw=1280&bih=647>

Why would people violate a river they so venerate? It may seem strange that citizens would not protect a river they worship, but many Indian citizens believe the Ganges, as a kind of deity, is somehow immune to human pollution. What do you think about this contradiction?



An Indian boatman sits near the polluted river waters of the Ganges at Sangam, the confluence of the Ganges, Yamuna and mythical Saraswati rivers in Allahabad. National Geographic

Image: <http://www.smithsonianmag.com/people-places/ganges-200711.html> [Photograph by Diptendu Dutta, AFP/Getty]

2. Read the following hyperlinked stories about the Ganges from Smithsonian and National Geographic:
<http://www.smithsonianmag.com/people-places/ganges-200711.html>;
<http://news.nationalgeographic.com/news/2011/11/111123-india-ganges-river-pollution/>
<http://www.gits4u.com/water/ganga.htm#Ganga%20India%27s%20national%20river>

Compare living in a city by the Ganges to living where Luis lives, in the South Bronx in New York by the three rivers, the Hudson, the East River and the Bronx River (see [Water Stories Supplement](#)).

3. Can Industry pollute our rivers just because they employ people and manufacture products we want? *“Among the most polluting industries on the Ganges, are the tanneries, especially near Kanpur, which empty toxic chrome into the river. The river basin also has sugar and paper mills, cloth, woolen, cotton and rayon mills, battery industries, thermal powerhouses, distilleries and fertilizer corporations. Heavy metals such as cadmium, zinc, nickel, lead, chromium and copper are concentrated in the river water and the sediments. An estimated 6 million tons of chemical fertilizers and around 9,000 tons of pesticides are added to the Ganges water each year.”* <http://varenya.hubpages.com/hub/Crimes-against-a-Goddess-the-pollution-of-the-Ganges>

Kanpur is home to about 400 tanneries. Read the following story and watch the national Geographic Video. What should India do about the pollution from its Tanneries? If they close down, thousands of jobs will be lost.

<http://www.livemint.com/2008/09/26221545/Kanpur8217s-tanneries-earn.html>
<http://video.nationalgeographic.com/video/specials/in-the-field-specials/cousteau-ganges-kampur-threats/>

4. Gloversville, in Fulton County New York was once called the Glove Capital of the World because of its primary industry. Gloversville is situated on Cayadutta Creek, considered at one point to be one of the worst polluted streams in the state. What are some of the ways that the Cayadutta Creek and the Ganges differ? How are they similar?

<http://news.google.com/newspapers?nid=1960&dat=19940523&id=WGdGAAAIBAJ&sjid=40qMAAAIBAJ&pg=2993,6207719>

5. **For older students:**

Read the following case study about water resources and population growth along the river in Bangladesh. Using the study, identify the linkages between population growth and water, noting the key demographic and water resource concerns, in the Ganges Flood Plains and discuss the proposed actions in light of these linkages.

<http://www.aas.org/international/ehn/waterpop/bang.htm>;

Discuss growing populations around the world and the implications on freshwater resources in other locations. Research clean-up projects aimed at large-scale river clean-ups. Begin by reviewing the following article on a proposed clean-up project funded by the World Bank:

<http://southasia.oneworld.net/todayshadlines/world-bank-extends-loan-for-cleaning-the-ganges>.

The enlarged map of Ganga river from Gangotri to Bay of Bengal.

<http://www.gits4u.com/water/ganga.htm#Ganga%20India%27s%20national%20river>



Research similar large scale water clean-up projects on the Ganges and on other large rivers around the world.* Discuss the obstacles and success encountered during these clean-up projects. Compare the case studies and discuss what needs to happen in Indian for the project to succeed.

For additional background on the history of the Ganges and Ganges clean-up projects, review: <http://www.thehindu.com/life-and-style/kids/article2292290.ece> and

<http://southasia.oneworld.net/todayshadlines/waterman-of-india-quits-ganges-panel-over-govt-apathy>

Listen to the BBC audio file on the clean-up project:

<http://www.bbc.co.uk/programmes/p008zr9j>.

*For example, review the history of the Thames clean up. Review the links below:

<http://www.gresham.ac.uk/lectures-and-events/londons-ecology-how-clean-is-the-thames>

<http://varenya.hubpages.com/hub/Crimes-against-a-Goddess-the-pollution-of-the-Ganges>

<http://www.who.int/features/factfiles/sanitation/facts/en/index1.html>

http://www.who.int/water_sanitation_health/resourcesquality/wpccasestudy1.pdf

FOOTNOTE:

1. Water Pollution Control – A Guide to the Use of Water Quality Management Principles. Edited by Richard Helmer and Ivanildo Hespanhol. Published on behalf of the United Nations Environment Programme, the Water Supply & Sanitation Collaborative Council and the World Health Organization by E. & F. Spon ©1997 WHO/UNEP ISBN 0 419 22910 8