**Israel, The Dead Sea and the Water Shortage.**

Read the Wikipedia page here <https://en.wikipedia.org/wiki/Environmental_issues_in_Israel> and use the images on the website.

EXTRA RESOURCE http://www.bbc.com/news/world-middle-east-36477284

Then read this and answer the questions

The Dying of the Dead Sea

**The ancient salt sea is the site of a looming environmental catastrophe**

Gidon Bromberg is nervous. On a sweltering August afternoon, the Israeli environmental activist leads me along the shore of the Dead Sea, watching every step we take. Towering sandstone mesas loom above our heads; the saline lake extends like a shimmering sheet of turquoise toward the hazy mountains of Jordan. The temperature is pushing 110 degrees, the sun beats down on my neck, and my feet crunch pieces of petrified driftwood and calcium deposits—wrinkled white sheets that bear a disturbing resemblance to human rib cages. Bromberg stops abruptly beside a gaping crater, more than 60 feet deep, and a sign that reads DANGER: OPEN PITS. “Better not walk any farther,” he warns. “The ground could swallow us whole.”

Up and down the Dead Sea, on the Jordanian and Israeli coasts, the shoreline is pockmarked by these sinkholes—testifying to an environmental catastrophe. The Dead Sea is shrinking, and as it recedes, the fresh water aquifers along the perimeter of the lake are receding along with it. As this fresh water diffuses into salt deposits beneath the surface of the shoreline, the water slowly dissolves the deposits until the earth above collapses without warning. More than 1,000 sinkholes have appeared in the past 15 years. In that time, sinkholes have swallowed a portion of road, date-palm fields and several buildings on the sea’s northwest coast. Environmental experts believe that hotels along the shore are also in danger. “The good news is that if you get swallowed by a sinkhole, they name it after you,” Bromberg deadpans.

As we trudge back along the shore, Bromberg points out the Ein Gedi Spa, built along the waterline about 20 years ago. Today the resort sits marooned on a spit of wasteland almost a mile from the water; a trolley carries guests to and from the beach along a track that must be extended every year. Driving a few miles south, past the ancient Jewish fortress of Masada, we come upon Ein Bokek, a garish strip of high-rise hotels that calls to mind Atlantic City, New Jersey. Few tourists arriving at Ein Bokek are aware of the resort’s not so little secret: the shallow water in front of the hotels isn’t the Dead Sea, which dried up here in the 1980s. It is a reservoir maintained by Dead Sea Works, an Israeli company that pumps water from the northern to the southern part of the lake, where it is evaporated to extract minerals such as potash and bromide—a process hastening the sea’s demise. “It’s all artificial,” says Bromberg. “But you’re not going to hear that from the hotel management.”

Bromberg was born and raised in Israel, graduated from AmericanUniversity’s law school in Washington, D.C., and returned to Israel 17 years ago. Now he directs Friends of the Earth Middle East, the most active of several environmental groups working to galvanize concern for the dying sea. With a staff of Israelis, Palestinians and Jordanians, and with offices in Tel Aviv, Bethlehem and Amman, Friends of the Earth has become a model of regional cooperation at a time when most such ventures have all but disappeared.

During the past several years, Friends of the Earth has sponsored exhibitions of Dead Sea photographs and conducted tours for journalists and government officials. The organization has lobbied Jordan, Israel and the Palestinian Authority to nominate the Dead Sea as a United Nations World Heritage site—a designation that would mandate creation of an environmental protection plan and restrict development. The Friends have also pressured the region’s governments to reform what they call “shortsighted” water policies that they say have been sucking dry the Dead Sea—and the rivers and streams that feed it—for decades.

The work has been difficult—and at times dangerous. During the most recent wave of Palestinian uprisings, beginning five years ago, simply bringing together staffers from Jordan, the Palestinian territories and Israel turned into a logistical nightmare. Islamic militants have opposed such joint ventures, accusing Arab staffers of acting as “collaborators” with Israel. Four years ago, during an intense period of Israeli-Palestinian violence, gunmen fired on Friends of the Earth’s Munqeth Mehyar as he drove away from his Jordanian office in downtown Amman. (He escaped without injury.) “We thought about closing the Amman office after that incident, but the staffers here said no way,” Mehyar said. “They believed that would be giving in to terror.” Instead, Mehyar and his colleagues received protection from Jordanian police and intelligence. The assailants were eventually captured.

Created by the same shift of tectonic plates that formed the Syrian-African Rift Valley several million years ago, the Dead Sea owes its precarious state to both human and geological factors. Originally part of an ancient, much larger lake that extended to the Sea of Galilee, its outlet to the sea evaporated some 18,000 years ago, leaving a salty residue in a desert basin at the lowest point on earth—1,300 feet below sea level. Since then, this body of water, known as the Dead Sea since Greco-Roman times, has maintained its equilibrium through a fragile natural cycle: it gets fresh water from rivers and streams from the mountains that surround it and loses it by evaporation. The evaporation process, combined with its rich salt deposits, account for its extraordinary—up to 33 percent—salinity (compared with the up to 27 percent salinity of Utah’s Great Salt Lake). Until the 1950s, the flow of fresh water equaled the rate of evaporation, and Dead Sea water levels held steady. Then in the 1960s, Israel built an enormous pumping station on the banks of the Sea of Galilee, diverting water from the upper Jordan, the Dead Sea’s prime source, into a pipeline system that supplies water throughout the country. To make matters worse, in the 1970s Jordan and Syria began diverting the Yarmouk, the lower Jordan River’s main tributary.

Since then, the Dead Sea has declined dramatically. It needs an infusion of 160 billion gallons of water annually to maintain its current size; it gets barely 10 percent of that. Some 50 miles long in 1950, the sea is about 30 miles long today. Water levels are falling at an average rate of three feet per year. According to a recent Israeli government study, the rate of evaporation will slow and the Dead Sea will reach equilibrium again in a few decades—but not before losing another third of its present volume.

Such a scenario represents an immeasurable loss. Tourists have flocked here for generations to float in the brine, soak in mineral and mud baths and take in the dramatic panorama of Israel’s JudeanDesert and Jordan’s MoabMountains. Sufferers from chronic skin diseases, such as psoriasis and eczema, routinely make pilgrimages, attracted by the bone-dry climate, oxygen-rich atmosphere and—some claim—the sea’s miraculous healing properties.

A refuge over the millennia for messiahs, martyrs and zealots, the Dead Sea region abounds with sites sacred to Islam, Christianity and Judaism. Some Muslims believe that Moses, whom they regard as a prophet, lies buried in a hilltop mosque just off the main road from Jerusalem. Jesus Christ was said to have been baptized in the Jordan River after traveling down to the Dead Sea from Galilee. At the fortress of Masada, nearly 1,000 Israelites committed suicide en masse in A.D. 73 rather than surrender to the Romans. Fifth-century ascetics from Asia Minor retreated to the region’s cliffside caves and built monasteries such as Mar Saba, the oldest continuously inhabited one in the world. In 1947, Bedouin shepherds, searching for a stray goat in the Judean Desert, entered a cave at Qumran near the north shore of the lake and discovered clay jars containing 2,000-year-old scripture written in Hebrew, Greek and Aramaic—the Dead Sea scrolls.

And despite its name, the Dead Sea helps support one of the world’s most complex and vibrant ecosystems. Fed by fresh water springs and aquifers, a half-dozen oases along the shore harbor scores of indigenous species of plants, fish and mammals, including ibex and leopards. About 500 million birds representing at least 300 species, including storks, pelicans, lesser spotted eagles, lesser kestrels and honey buzzards, take refuge here during a biannual great migration from Africa to Europe and back again. Ein Feshka, a lush expanse of tamarisk, papyrus, oleander and pools of crystal water, was used by the late king Hussein of Jordan as a private playground in the 1950s and early ’60s. But as the Dead Sea recedes, the springs that feed the oases are moving along with it; many experts believe that Ein Feshka and other oases could wither away within five years.

In april 1848, when Palestine was a desolate outpost of the Ottoman Empire, American adventurer Lt. William Francis Lynch embarked on a U.S. Navy expedition to chart the course of the Jordan River to the Dead Sea. Lynch and his party of scientists and topographers set off in three vessels from the Sea of Galilee and quickly found themselves swept up in a frothing torrent. The river was hundreds of feet wide in some places, interrupted by “frequent and most fearful rapids,” Lynch wrote. “Placing our sole trust in Providence [we] plunged with headlong velocity down appalling descents.” They reached the Dead Sea after seven grueling days, losing one boat, which had been battered to pieces on the rocks.

The story of the Jordan River’s decline begins at the very place where Lynch launched his boats in what is no longer a roaring torrent but a pond of sluggish green water. In 1953, Israel constructed a dam, the Degania Gate, a few hundred feet south of this spot, to collect water from the Sea of Galilee for the National Water Carrier project. The dam reduced the Jordan’s flow to a trickle.

About five miles south of the dam, Bromberg and I enter the Degania kibbutz, one of Israel’s oldest kibbutzim, or agricultural cooperatives, founded in 1909. We bounce along a rutted dirt track through corn, tomato and avocado fields, following two giant metal pipes that siphon off some of the Jordan’s water for an extensive irrigation system. Dozens of other collective farms in the area also dip into the river. After a few minutes we arrive at a small earthen dam, where the Jordan comes to a pitiful end. On one side lies a stagnant pool covered by algae. Arusted rowboat is submerged beneath the surface. On the other side of the dam, liquid gushes from two pipes and flows down the riverbed. One flow consists of raw sewage from kibbutzim in the area. The other is saline water from springs flowing into the Sea of Galilee mixed with partially treated sewage from Tiberias, captured and removed to decrease the lake’s salinity. The Jordan’s once annual flow of 343 billion gallons of fresh water has now been replaced by 40 billion gallons or so of mostly sewage and saline water. Irrigation “is one of the main reasons that the Dead Sea is dying,” Bromberg tells me.

Another reason, according to environmentalists and various government officials, is a water policy on the part of Israel, Jordan and Syria that encourages unrestricted agricultural use. From the first years of Israel’s existence as a Jewish state, for example, when collective farming transformed much of it into fertile vineyards and vegetable fields, both Labor and Likud governments have bestowed generous water subsidies on the nation’s farmers. The results have been disastrous: today, agriculture accounts for just 3 percent of Israel’s gross national product and uses up to half of its fresh water. Recently, Uri Sagie, chairman of Israel’s national water company, told a conference of Israeli farmers that a growing and irreversible gap between production and consumption looms. “The water sources are being depleted without the deficit being restored,” he warned. Jordan lavishes similar water subsidies on its farmers with similar consequences: the kingdom takes about 71 billion gallons of water a year from the Yarmouk River and channels it into the King Abdullah Canal, constructed by USAID in the 1970s to provide irrigation for the JordanValley; Syria takes out another 55 billion gallons. The result is near-total depletion of the lower Jordan’s main source of water.

Several days later on another outing with Bromberg,we are hiking through the Ein Gedi Nature Reserve, on a ridge 600 feet above the Dead Sea. Astream of fresh water, originating in an underground spring deep in the JudeanDesert, rushes through a steep canyon dense with tamarisk, pine, birch and oleander. We ascend to the top of the canyon, where a cascade tumbles down sandstone cliffs into a cool, clear pool.

Yet not a single drop of that spring water—some 114 million gallons a year—reaches the Dead Sea. Just outside the nature reserve, the Ein Gedi kibbutz takes it, bottling some for a popular brand of mineral water and using the rest to irrigate the kibbutz grounds and botanical gardens, a sea of green amid the desert’s desolation. To Bromberg and other environmentalists, kibbutz policy is rank hypocrisy. “The people of the Ein Gedi kibbutz are the first to complain about sinkholes along the shore,” Bromberg says. “But they don’t blame themselves for contributing to the problem.”

Ein Gedi’s residents deny any responsibility for the Dead Sea’s plight—and lash out both at green groups such as Friends of the Earth and at the Israeli Knesset (Parliament), which recently sought to crack down on the kibbutz’s water usage. “It’s garbage what they’re saying. If you take all water from Ein Gedi’s spring, it’s a small drop in the Dead Sea,” Merav Ayalon, Ein Gedi’s spokesperson, told me. “The problem isn’t us. It’s the Israeli government.” Ayalon blames the Water Commission and the Agriculture Ministry for a shortsighted policy that, she says, has wrecked the local economy. “Our date palms are dying because of the sinkholes,” she says. “Our farmers can’t work [in some groves] because it’s gotten too dangerous. People have come close to being killed. We almost had to close the kibbutz, and the government does nothing. It has no policy to save the Dead Sea.”

So what is the answer? Environmental activists say that one solution is to eliminate the water subsidies altogether. “Unless water is priced at its real costs,” says Ra’ed Daoud, managing director of ECO Consult, a water-use consulting firm, “there’s no way you’re going to reduce agriculture.” But because the region’s agricultural lobby is strong and the environmental movement weak, says Daoud, there has been insufficient leverage for change. Israel’s water commissioner, Shimon Tal, recently spoke publicly about the need to reduce some subsidies, but he admitted that it would be a long and difficult battle. Even Prime Minister Ariel Sharon, who grows vegetables on his farm in the Negev Desert, likes the subsidies. “We desperately need to change the situation, but the agriculture lobby won’t even talk about it,” says Tamar Keinan, a former Israeli Water Commission official turned project manager for Friends of the Earth.

Another approach is to encourage alternate water sources. Friends of the Earth Middle East is part of a coalition of 21 environmental groups that has developed proposals to conserve household water use (about 133 billion gallons a year, as much as that used in agriculture) and to regulate the amount that can be taken out of Israel’s springs. In addition, the Israeli government is promoting the building of wastewater treatment plants and desalination facilities; the first large one on the Mediterranean was completed this past August. Over the next five years, the government says, these facilities will provide as much as 106 billion gallons of fresh water annually for agricultural and domestic consumption.

Friends of the Earth is also taking its message to the farmers themselves—encouraging them to plant crops that use less water and spelling out the advantages of renewed tourism in the area. “Israeli agriculture is incredibly mismanaged,” Bromberg says as we pass banana plantations along the Jordan River bank. “The farmers here could be planting olives, flowers and other crops like dates that don’t require fresh water. They could be using treated sewage water and allow fresh water to flow back into the Jordan River.” Friends of the Earth cites a HaifaUniversity study that argues that current uses of the Jordan River make no sense. “The potential tourism-dollar return of a healthy river and a healthy Dead Sea outweighs the little return that agriculture offers,” says Bromberg.

To see the possibilities of tourism for myself, I visit the Gesher kibbutz, which straddles the ancient trade route from the port of Akko and Jerusalem to Damascus and Baghdad. The Romans, Ottomans and British all built bridges over the Jordan at this spot; the spans remained intact until May 1948, when defending guerrillas blew them up partially to prevent 3,000 Iraqi troops from invading the newly declared state of Israel. Last year, the kibbutz put a train car on one of the bridges and restored some buildings in the area, including a 13th-century khan, or guesthouse, and an Ottoman-era customhouse, to lure tourists to the site.

But it remains a hard sell. The border zone, where the kibbutz is located, is one of the tensest places in the world—bristling with watchtowers, machine-gun nests and barbed wire. As we head down to the riverbank, Nirit Bagron, my tour guide from the kibbutz, halts before a military security fence covered with sensors that can detect would-be terrorist infiltrators from Jordan. Bagron, who brings tourists here by special arrangement with the Israeli Defense Forces, is quickly checked by Israeli troops and permitted to pass, as am I. As we approach the river, she points out three observation posts perched atop the rugged hills lining the Jordanian side. “They’re watching us,” she tells me. “We’ve never talked to them, but sometimes, on a very hot day, we see the Jordanian soldiers go down there to fish and even to swim.”

The Jordan River, its mix of untreated sewage and saline runoff flowing below us, courses through a black basalt canyon and under the ancient Roman bridge. Bagron looks down and grimaces. “I wouldn’t dive in there, not even on a hot day,” she tells me. “It’s very bad, bad water.”

***QUESTIONS***

 ***1. Briefly describe the climate and relief of the Dead Sea area of Israel.***

***2. Outline the Environmental problem Israel faces with the Dead Sea.***

***3. Suggest solutions to the problem and justify why you think one of them is the best.***