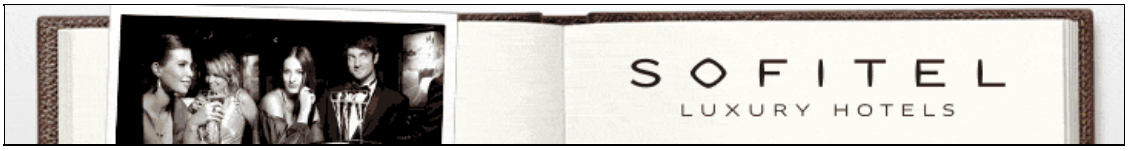

IHT SPECIAL

Restoring Iraq's Garden of Eden

By ERICA GIES
Published: April 17, 2013

LONDON — Azzam Alwash says he remembers the reeds towering above his head, lining cool corridors in the Iraqi heat as he sat with his father, the district irrigation engineer, in a small boat plying the waters of the ancient wetlands between the Tigris and the Euphrates rivers.

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That was the early 1960s, and the marshlands covered as much as 20,000 square kilometers, or 7,700 square miles. “I have very warm memories of those times,” Mr. Alwash, a 54-year-old, Iraqi-born, U.S.-educated civil engineer, said in an interview here last month.

Biblical scholars say this massive oasis in the desert may have been the Garden of Eden. For more than five millennia, tribal groups of Marsh Arabs lived sustainably in this water world, using the dominant plant, a giant grass called Phragmites australis, for housing, animal feed, fuel, and commerce. Under their ministrations, the marshes teemed with life, serving as one of the world’s most important stopovers for migratory birds and as breeding habitat for Persian Gulf fisheries.

But in Mr. Alwash’s lifetime, those waters nearly ceased to be.

Now, however, they are experiencing rebirth, thanks in part to Mr. Alwash, who this week received the Goldman Environmental Prize, which honors grass-roots environmental activists.

In the 1970s upstream dam projects began to reduce water levels; and in the early 1990s Saddam Hussein ordered the construction of massive diversion canals and dams that drained more than 90 percent of the original marshlands. His motive was to retaliate against the Marsh Arabs for a Shiite uprising and to destroy rebel hideouts. After siphoning away the water, Hussein ordered the land poisoned and burned, leaving the wetlands a cracked, dusty salt pan.

According to a 2011 U.N. paper on managing change in the marshlands, some 175,000 people were forced to flee. From the United States, Mr. Alwash watched, aghast.

Mr. Alwash had left Iraq in 1978 and landed in the United States, where he ultimately earned a doctorate, got married, and had two daughters.

In response to the attack on the marshlands, Mr. Alwash and his wife Suzanne Alwash, an environmental geologist, founded the Eden Again Project in 2001, the seed for a nongovernment organization, Nature Iraq, which works to protect Iraq’s environment. Mrs. Alwash has written a book about the restoration effort, “Eden Again: Hope in the Marshes of Iraq,” due out in July.

Seeing opportunity in the 2003 U.S.-led invasion of Iraq, Mr. Alwash left his family for the

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war zone, to see what he could do about restoring the wetlands. When he arrived, he found that some Marsh Arabs had already begun to break holes in the levies to reflood the land. He set to work to support them, leading a team of scientists to develop a master plan to restore the marshes.

Mr. Alwash has since worked through Nature Iraq teaching Iraqis and Iraqi institutions — governments, universities, nonprofit organizations — about environmental awareness and stewardship. That has included meetings with government officials to convince them of the environmental, social and economic benefits of restoring the marshes and the promotion of community-based environment clubs. To support this work, Nature Iraq has hired its own scientists and worked with researchers at Basra University to build a database of Iraq's environmental conditions and trends, focusing particularly on water resources, ecology and biodiversity.

Today the wetlands are in recovery. The Goldman Prize says that about half the historical area is now reflooded. Water levels fluctuate due to seasonal changes, drought and upstream water diversions but fish, birds, animals and people are returning.

A subspecies of otter, Lutrogale perspicillata maxwelli, thought to be extinct, was recently sighted in the marshes. "The warbler is back in good health," Mr. Alwash said. "We've seen the Euphrates soft-shelled turtle in abundance."

Mr. Alwash hopes to see the marshes become the country's first national park this spring.

But is it enough to just let in the water? Is the ecosystem healthy? A 2010 study by Iraqi and Canadian scientists found that most plant species had reappeared — but not all. Plant quantities and diversity were low, it said.

Still, Joy Zedler, a University of Wisconsin wetlands restoration biologist, is optimistic. "If I had to restore a wetlands with a gun pointed to my head, I'd pick the Mesopotamian wetlands," she said in a phone interview last month. That's because the dominant tall reed there, Phragmites australis, is an aggressive invader in restoration efforts elsewhere. "That's the kind of native plant you want in a restoration site," said Ms. Zedler, who was a co-author of the Mesopotamian marsh restoration plan.

The ecosystem is resilient, having been modified by human hands for millennia, she added.

A key concept in restoration is adaptive management, in which scientists conduct research as wetlands are rewatered and change course if needed. But adaptive management was not possible with the rapid reflooding in Iraq.

"People really needed the food," Ms. Zedler said. "They were not going to wait to test the fish for contaminants if their kids were starving."

In fact, water quality is an ongoing problem. According to the 2011 U.N. report on the region, marshland water is generally not safe for human consumption and is potentially unsafe for agriculture and other economic uses. A Nature Iraq scientist found declines in fish species that require clean water.

While traces of chemical weapons used to destroy the marshes are a concern, a quotidian issue is a bigger problem. "The Tigris and Euphrates are open sewers," said Mr. Alwash.

The bigger barrier to successful restoration, however, is water quantity. The headwaters of the Tigris and Euphrates Rivers are in Turkey, Syria and Iran. Upstream dams, particularly in Turkey, have reduced flows.

In 1977-78, the lowest flow in the confluence of the Tigris and Euphrates rivers was 990 cubic meters, or 35,000 cubic feet, per second, according to Michelle Stevens, of California State University Sacramento, a contributor to the marshland restoration plan. By 1993-94, that figure was 550 cubic meters per second. In 2008-09, the latest data available, it was less than 100 cubic meters per second. Yet dam building continues.

Turkey's Southeast Anatolia Project includes more than 30 major upstream dams, the majority of which are completed, said Mr. Alwash.


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“My next challenge is to try to help Iraq, Turkey and maybe even Syria and Iran to reach agreement on the equitable distribution of the water,” said Mr. Alwash, who is building partnerships among regional nonprofit organizations and universities to study the issue and propose solutions. He is also planning a floating demonstration down the Tigris River to publicize the problem.

With reduced water flows comes a companion problem: too much salt. Regional farmers still use the ancient practice of flood irrigation, Mr. Alwash said, which brings salt to the surface. Historically, annual floods washed away the salt and deposited new silt and nutrients. For thousands of years, “farmers didn’t need fertilizer,” he said.

“But the last major flood in Iraq was in 1968,” he said, citing the dams as a cause. “If the Iraqi government doesn’t address this problem, agriculture will die in the land where it was born.”

One answer is drip irrigation. Using less water would reduce saline runoff to the Tigris and Euphrates, he said. He has proposed that Iraq capture and sell gas currently flared during oil production to raise money for drip irrigation systems. It could then either sell the systems at a subsidized rate to both Iraqi and upstream farmers, or give them away as part of a watershed management agreement.

The Goldman Prize administrators recognize that the Mesopotamian marshes are not fully restored. The deputy director of the prize organization, Lorrae Rominger, said, “What Azzam has done to date is remarkable, and we hope that winning the prize will help support the work he has in front of him.”

As for Mr. Alwash, he said he dreams of the day when the marshes become a national park and ecotourism destination. Then he will at last be able to share the landscape of his boyhood with his daughters.

Missing his daughters’ birthdays, spelling-bee wins, and first dates was very hard, he said. “But I cannot give up Iraq. I found my calling.”

A couple of months ago, his daughter sent him a speech she’d given to her class. “In the middle of that letter, I started sobbing,” he said, his voice breaking. “She understands. I’m forgiven.”

This article has been revised to reflect the following correction:

Correction: April 29, 2013

An earlier version of this article failed to fully identify a scientist who commented on water flows in the Tigris and Euphrates rivers. The scientist was Michelle Stevens, of California State University Sacramento, a contributor to the marshland restoration plan.

A version of this article appeared in print on April 18, 2013, in The International Herald Tribune.

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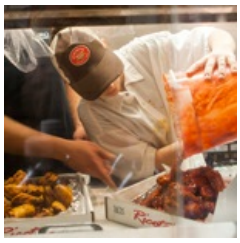

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