

FROM TAINTED DITCH TO STOVETOP TO TAP

Canada-India collaboration develops system to end boil-water advisory

Vancouver Sun 20 Mar 2017 1:51 more DAN FUMANO dfumano@postmedia.com twitter.com/fumano Dan Fumano's trip to India was supported by an Asia Pacific Foundation media fellowship, which is sponsored by Cathay Pacific.

The Trudeau government promised real change on a number of things, but this is one of the most pressing.

An elder in the Lytton First Nation told Jim Brown a story of her own relatives, who died years ago after developing diarrhea. The family's matriarch, Brown said, never understood the problem was likely caused by their drinking water,

which they drew from a ditch.

"It was probably E. coli from the cattle that were walking in her ditch line, because at that time, they used to get their water right from the ditch and drink it," Brown said as he stood over a similar hand-dug canal at a snowy hillside farm in Lytton. "It was the cattle walking in their ditch line, crapping in their ditch line. So they lost quite a bit of children back in that day. They had no control, and they didn't know what was causing the sickness."

Today, he said, the woman's descendants live in her old house, with running water, which, as of December, they can safely drink straight from the tap.

Brown, who retired last year as Lytton First Nation's water operator after 35 years working for the band, said it was about 30 years ago that those children died. "That's not that long ago," Brown said.

That month, decades-long boil-water advisories were lifted for two smaller water systems in Lytton

First Nation. Earlier last year, a centralized water system serving Nick-eyeah, another Lytton reserve, officially ended a water advisory, after the installation of a new treatment plant with help from an international collaborative project connecting Canada and India.

Tony Hnilica, who lives near the new plant, said the system has improved his life.

"Now you don't have to filter it or anything, it's just pure," he said in his kitchen, drawing a glass from the tap and taking a drink. "Now there's no chance of anybody getting sick from water.... Everybody should have this kind of system."

Despite the lifting of six multi-year water advisories for various reserves in the Lytton First Nation's territory, centred where the Fraser

River meets the Thompson, other boil-water and do-not-consume advisories have remained or regularly recurred in the community, while some systems that serve just a handful of homes still have no water treatment at all.

The Village of Lytton itself, about half of which is First Nations people, also has regularly occurring drinking water advisories. This situation is not unlike other First Nations across Canada: More than 150 drinking water advisories remain in effect on reserves in Canada, some of them in place for years.

Brown, who's active in national networks of First Nations water operators, hopes other communities in Canada can learn from the solutions they've found in Lytton.

In October, Brown retired and

his nephew, Warren Brown, took over the role of water system operator after 15 years of working under his uncle. Both take pride when drinking water advisories are lifted.

About half of Lytton First Nation's 2,000 members live off the reserves, Warren said, with many having moved to "the city" (often Kamloops, or some other municipality in the area) over the years for more employment opportunities and comfortable living standards.

"The cleaner the water (in Lytton's reserves), the more people will be inclined, I think, to maybe move back. People grow up here, then they move away to the city, where they can turn their tap on, drink the water, and know it's safe. Whereas you come out in the boon-docks and you can't do that — sorry, you've got to boil your water first, or you buy your bottle water and bring it over," he said. "But now they can actually turn their water on, just like they would in the city, and drink right out of the tap. It's great."

Ending the long-standing Nick-eyeah water advisory last year was backed, in part, by IC-IMPACTS, jointly funded by the governments of Canada and India.

The treatment system, drawing water from Lytton's Nick-eyeah Creek, was designed in Madjid Mohseni's lab at UBC, with funding for the pilot project from ICIMPACTS.

Now, Mohseni and IC-IMPACTS are trying to replicate the success of Lytton's facility elsewhere in B.C., including northern B.C.'s Tlaz'en First Nation, and a nonnative rural community on Texada Island. Mohseni is also collaborating with scientists in Bangalore on another IC-IMPACTS project, researching desalination technologies that could apply not only in water-scarce southern India, but also in the Canadian prairies, where many aquifers have "brackish water" containing high levels of salt and minerals.

The keys to the system's design, Mohseni said, are its relative low

cost (less than half the amount an engineering firm quoted the band, Brown said) and ease of operation.

"When engineering firms propose solutions, they often propose the Cadillac solution," Mohseni said. "Often they are over-designed, and not necessary for what that community needs or has the capacity to operate."

The Lytton system is a unique combination of existing technologies, Mohseni said. He has learned, from his IC-IMPACTS projects in both India and Canada's First Nations, the importance of tailoring water solutions for a specific community, with an understanding of its needs and the community's ability to maintain the system.

He has seen far too many projects, he said, in both India and Canada, where an NGO, company or government installs a large, modern and very expensive water system to great fanfare, then leaves the community on its own, and within a few years, the system falls into disrepair or disuse.

Mohseni knows one northern B.C. First Nation where a very expensive, decade-old, and dysfunctional water facility has become a "sore point" for the community. "They see that sitting there, it's a piece of junk to them," he said. "Someone told me: 'I wish they would come tear that thing down so I don't have to look at it.'"

IC-IMPACTS estimates that more than five million Canadians live with a risk of drinking water contamination, most of them in remote rural or First Nations communities. Prime Minister Justin Trudeau made the topic an election campaign issue, pledging in October 2015 to end boil-water advisories in First Nations communities within five years. But some have doubts about the government's ability to meet that goal.

Last month, the Council of Canadians and the David Suzuki Foundation released a report, saying the government could not "end all drinking water advisories affecting First Nations communities by 2020



Lytton First Nation band councillor and former operations manager Jim Brown is happy to see safe drinking water.



Emma Lui

month's report, one of the contributors, Council of Canadians' water campaigner Emma Lui, analyzed government figures on more than 150 drinking water advisories in First Nations communities in Canada. Her analysis showed as many as a quarter of First Nations people on reserves in Canada could be affected by drinking water advisories. The precise number is hard to nail down, since exact population figures were not available for communities served by these water systems, many of which are small.

Last year's federal budget offered an additional \$1.8 billion over five years to support clean drinking water and the treatment of waste water on reserves. But Lui pointed to a 2011 government report that estimated the combined capital and operating costs to meet the water and waste-water needs of First Nations communities to be \$4.7 billion over 10 years, plus another \$419 million a year for operating and maintenance.

"The Trudeau government promised real change on a number of things, but this is one of the most pressing," Lui said. "And we're waiting to see the real change happen."

without significant changes."

Roxanne Green of Shoal Lake 40 First Nation said: "We have many First Nations communities in Canada that are living in Third World conditions in a first-world country. And that is not acceptable."

Shoal Lake provides fresh tap water for Winnipeg residents 180 km to the west, but the people of Shoal Lake 40 First Nation haven't been able to safely drink their tap water for two decades.

Indigenous Affairs department spokeswoman Valerie Hache said by email: "We are currently on target to lift all long-term drinking water advisories on INAC-funded systems in First Nations communities within the five-year deadline."

Following the release of last



Warren Brown, operations and maintenance manager for the Lytton First Nation, keeps an eye on the Nick-eyeah mobile water treatment plant.

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Vancouver Sun 20 Mar 2017 (AS)

WORK WILL BE FLOWING 2

Ganges cleanup a huge job

Vancouver Sun 22 Mar 2017 [+1 more](#) DAN FUMANO

On the 12th storey of the stylish Naman Midtown skyscraper, a stone's throw from the Canadian Embassy and just up the road from the Trump Tower Mumbai, Joel Fernandes' wellappointed office is furnished with touches from far away: doors made of Douglas fir, hemlock cabinets, a pagoda made of western red cedar, a Haida blanket.

Now Fernandes wants to see more of B.C., and Canada, in India.

In August, Fernandes took over as director of the B.C. government's International Trade and Investment Office, India, helping B.C. companies to do business in India and Indian companies to invest in B.C. The following month, he was in downtown Vancouver for the B.C.India Partner-

ship Summit, appearing on a panel to discuss clean-tech opportunities and encouraging Canadian business-people to dive in and do business in India.

Fernandes has a particular interest in getting Canadian firms involved in India's massive effort to clean the Ganges River, which is at once sacred, vital for the livelihood of hundreds of millions of people, and heavily polluted by industry.

But, he said, Canadian business-people often hesitate to get involved in such a large project on the far side of the planet.

"What I said was: 'Forget about

size. We are not living in the size world anymore, it's how fast you can get to it. They say it's not the big fish eating the small fish anymore, it's the fast fish eating the slow fish," he said. "You've got to move on from that thinking.

"Because there is an opportunity — the river is not going to be cleaned right from A to Z, you're going to clean it in parts. And you might get one piece of that pie, and that could be a couple of million dollars for that small company. It's a big pie."

The Indian government approved a budget of 200 billion ru-

pees, or almost \$4 billion, for the Ganga Rejuvenation project. The World Bank has pledged US\$1 billion in support of the effort.

The project holds special importance for Prime Minister Narendra Modi, a Hindu nationalist, who has said: "It's my destiny to serve Maa Ganga (Mother Ganges)," and "Mother Ganges has called me."

Modi has also said that in addition to the river's huge cultural and spiritual significance, "cleaning the Ganges is also an economic agenda."

Purifying the holy, but filthy, waterway would be no small feat: The World Bank reports the 50 major In-

dian cities along the Ganges produce around three billion litres of sewage every day, only a fraction of which is treated before being dumped in the river.

Fernandes, over Indian craft beers in an artsy Mumbai bar in a converted former textile mill, said: "I am an Indian, I want the Ganga to be cleaned. And I want B.C. companies and Canadian companies to be involved in the work."

One Canadian looking at the opportunities presented in the Ganges is Jerry Hanna, whose company Clearflow Group Inc. has grown from an experiment with fish tanks in his basement to a global operation.

Following a successful pilot project over the last two years in Punjab in northern India, Hanna said, Clearflow has this year received a new round of approvals from the Indian government and is now "looking to expand those results in India."

Back in Canada, Clearflow's business over the past decade has focused on selling water treatment products and technologies to major Canadian resource companies such as Teck and Enbridge. And now as Clearflow looks to expand internationally, Hanna said, the company is in talks with governments, industry and regulatory agencies about improving waste water treatment and recycling for both industrial and municipal use.

In January, Hanna travelled through three Indian states with a program called Water Innovation Lab, part of a delegation of about 55 people, most of whom are based in India or Canada. While there, Hanna met with Indian government officials, research institutions, business associates and community groups, discussing his company's technology.

The innovation lab was co-hosted by IC-IMPACTS, an Indian-Canadian venture involving government, business and scientists in both countries, and Waterlution, an Ontario-based non-profit that organizes international water-themed events. Such

programs aim to "develop the next generation of water leaders," said Waterlution executive director Karen Kun.

These events, like January's 12-day innovation lab program in India, draw a broad cross-section of participants, including many in their 20s and 30s, working in various water-related fields: chemistry PhD students, professional engineers working for major municipalities, founders of tech startups. Hanna was impressed, he said, to meet young Indian entrepreneurs like Happy Patel, a 23-year-old grad student at McMaster University in Hamilton, Ont. who has launched 13 startup companies ("Eight failed," Patel said, "two I sold out, and three are ongoing") and Swapnil Shrivastav, also 23, whose own Bangalore-based startup has developed a technology for converting air into potable water.

Hanna says aligning his company with Waterlution and ICIMPACTS represents "a very big opportunity to take our technology to the next level ... because they're already global."

Reached at home in Sherwood Park, Alta. recently, weeks after returning from Delhi and days before departing for Shanghai, Hanna said his travel itinerary over the coming months includes several more trips to Asia and Europe, at the invitation of governments wanting to learn more about Clearflow's technology.

"I will probably only be home for about four months this year," he said.

The "next stage of the project" involves introducing bringing it back to Canada, Hanna said, starting with indigenous communities in North-east Alberta.

"The water issue in Canada for indigenous peoples is huge. They're carrying heavy metals, arsenic, E. coli, all these different things that are going into the water. And we know we can take these out," said Hanna, who grew up on Vancouver Island and comes from a Métis background. "Our goal is to develop the best water-treatment system



People fish, play, wash and worship in the heavily polluted Ganges River. Indian Prime Minister Narendra Modi has said it's his "destiny to serve Maa Ganga (Mother Ganges)."



"I am an Indian, I want the Ganga to be cleaned," says Joel Fernandes, director of B.C.'s investment and trade office in India.



IC-IMPACTS president and CEO
Nemy Banthia



Jerry Hanna

through this collective collaboration for not only India, but also for our Canadian indigenous peoples."

Water security challenges also have a "direct effect" on India's oft-touted GDP growth rate, said Sanjay Deshpande, head of operations for the Indian division of Clearford Water Systems, a publicly listed Canadian sewage treatment and recycling company.

"If you are a poor farmer in a ru-

ral village and you drink sewage-contaminated water and fall sick, you often have to be transported to a hospital far away in a larger town. While being treated, instead of working and earning money you are gradually going into a debt spiral caused by having to pay for daily living expenses and medical treatment, said Deshpande, who is based in Mumbai. "As approximately 65 per cent of India's population lives in rural India, you get an idea of the scale of the problem."

Clearford is "very interested" in the opportunity to get involved in the Ganges rejuvenation effort, Deshpande said, adding the company "has had many discussions with the government of India in this regard" and anticipates getting involved in future phases of the project.

Officials from IC-IMPACTS, including CEO Nemy Banthia and UBC's former president Arvind Gupta, met last month in Delhi with representatives from the National Mission for Clean Ganga to discuss opportunities for Canadian scientists and companies to get involved with the project. Banthia said the water sector in India presents an "absolutely huge, mindboggling"

business opportunity for Canadian firms.

The day after Banthia returned to Vancouver, he said he views ICIMPACTS's role as a trade catalyst as its "primary objective."

Canadian-Indian bilateral trade grew more than 40 per cent in the last five years. But, Banthia said, there remains huge room for growth. Canada's two-way total trade with India for 2016 was just over \$7 billion — just over a tenth of Canada's \$59.9-billion two-way trade with China.

About 70 per cent of Canada's total international trade is done with a single partner: the United States. So it's vital now, Banthia said, for Canadian businesses and governments to look at Asia and the rest of the world for business opportunities if the U.S. enters an era of trade isolationism under President Donald Trump.

"We'll be thankful to Trump in 40 years' time," Banthia said, "for making us stand on our own feet, and not putting all our eggs in one basket, which is what we have been doing. We need to really move ahead and start growing trade elsewhere." dfumano@postmedia.com twitter.com/fumano Dan Fumano's trip to India was supported by an Asia Pacific Foundation media fellowship, which is sponsored by Cathay Pacific.

ABOUT THIS SERIES

Raju does not own a photo of his daughter Sohani. She died from a water-borne illness in September, nine days before her eighth birthday.

The only mementoes he has are her birth certificate and a death certificate. To a poor farmer like Raju, the forms represent the extent of the Indian state's involvement in his remote tribal community, one of many where dirty water kills people every rainy season. The water crisis in Raju's community is something leading minds in India and Canada are racing to address, as they collaborate to tackle both countries' →