On Guar Beans and Fracking Giants

by Joyce Nelson

On July 4, 2013, North Dakota oil and gas billionaire Harold Hamm just couldn't contain his patriotic enthusiasm. In an op-ed commentary published by *Forbes*, Hamm wrote, "America has a long history of achieving the impossible. We defeated the British. We landed on the moon. We invented the Internet. And now we can add horizontal drilling to the list of American innovations that have changed the world forever."

Frustrated that hydraulic fracturing (fracking) has been getting all the attention surrounding the shale oil/gas revolution, Hamm insisted, "What is new is horizontal drilling. In 2000, there were less than 50 horizontal drilling rigs in the US and experts believed we had reached peak oil. In 2009, the Domestic Energy Producers Alliance issued its Declaration of Energy Independents [sic] due to the phenomenal turnaround caused by horizontal drilling." With 1,200 horizontal drilling rigs in the US by 2012, Hamm enthused, "This advanced technology allows us to drill two miles down, turn right, go another two miles, and hit a target the size of a lapel pin."

The combination of horizontal drilling and fracking certainly is a remarkable feat that has not been fully understood. Take, for example, the statement made by Pioneer Natural Resources (PNR) CEO Scott Sheffield during a quarterly conference call in 2013. Sheffield was discussing PNR's horizontal drilling and fracking in the Permian Basin of Texas. Sheffield said, "What's interesting, in six months, it's reached 140,000 barrels of oil equivalent. Our typical vertical well takes 30 to 35 years to produce 140,000 [barrels] on a vertical well. So we did that in six months."

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What seems like an offhand comment needs to be spelled out clearly: By switching from vertical well drilling to horizontal drilling and fracking, the company was able to suck out 3 decades worth of oil and gas production in 6 months! No wonder shale wells are depleted in about three years, as Canadian geologist David Hughes and others have pointed out, creating a drilling treadmill just to maintain continuous production and resulting in areas of North America that look like a pin cushion.

Billionaire Harold Hamm is right: the shale revolution is pretty astonishing, and the most surprising thing about it is that it all pretty much depends on a little bean.

A little bean

It sounds like something out of Brothers Grimm or Hans Christian Anderson. The giant shale oil/natural gas industry is actually dependent upon a little green bean, which is grown mainly by peasant farms in India. Without the guar bean, the industry would come crashing down like the giant felled in "Jack and the Beanstalk."

Guar beans are crushed to make guar gum, which has unique binding, thickening and emulsifying properties making it a crucial ingredient in the drilling slurries used to fracture shale rock formations. In the fracking process, millions of liters of water and fracking chemicals, mixed with large volumes of frac-sand, are pumped under extreme pressure into each well. Guar thickens the fluids, helping to keep the grains of sand in suspension until they are forced into the fractures blasted into the shale rock. The sand holds the fractures open while the oil or gas seeps out to the wellhead. Without guar gum, the frac-sand would simply fall to the bottom of the well.

Until about a decade ago, guar was bought mainly by the food industry, which uses guar gum as a thickener for things like ice cream and ketchup, and as an ingredient that keeps bakery goods moist. Guar grows best in heat and full sun, with frequent rains. Thousands of farmers in India, where most guar beans are grown, make a hard-scrabble living planting guar in July and selling their few acres at the farm-gate in October. Most of those farmers also grow millet, lentils and carrots.

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Then, like something in a fable, a big change came. With the advent of horizontal drilling and multi-stage fracking, the primary frackers like Halliburton, Schlumberger, Baker Hughes and Calfrac Well Services gradually started buying up guar gum like there was no tomorrow. A report by IMR Inter-

national placed the turning point at 2010. IMR founder Dennis Seisun told the media, "Basically the oil people are big buyers, big spenders. They go to the guar suppliers and say, 'What's your price, and give me all you got.' The food industry is getting left behind."

Before the shale boom, the food industry was paying about $2,000 for a ton of guar gum. By 2012, the price was $28,000.

Between 2006 and 2011, North American frackers quadrupled the amount of guar gum they were using, driving the amount up to one billion pounds in 2011. According to *Report on Business* (December 2012), a typical shale oil well "consumes roughly 4,000 kilograms" of guar gum. By 2012, Halliburton alone was using 14 million pounds of guar gum per month.

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Meanwhile, those peasant farmers in northwestern India (especially in Rajasthan state) couldn't believe their good fortune. With the frackers and the bakers and the ketchup makers all vying for guar, the price started rising like some moist gluten-free muffin. Guar farmers took out loans to buy equipment and extend their guar acreage. A few bought SUVs or gold bars, becoming the envy of their neighbors. Then those neighbors by the thousands stopped growing lentils and millet and jumped on the guar bean bandwagon. By 2012, 8.6 million acres of guar beans were being grown in India and the price just kept rising.

The price cut into the profitability of the frackers, who were paying some 30% of their well-service costs just for a bean. During the summer of 2012, the situation reached a climax. As *The Guardian* UK (December 18, 2012) reported, by that point demand for guar was so strong "that panic buying set in and prices were doubling week-by-week."

While the guar gum price was reaching toward $28,000 per ton (with an increase of 1,400% in a single year), one of the fracking giants took action. Halliburton CEO David Lesar complained to *Reuters* (July 20, 2012) that guar had "the fastest-moving commodity price that I have ever seen." But the *Reuters* writer noted "Halliburton itself probably contributed" to the volatility "by embarking on an aggressive and successful campaign to build up a private stockpile that would protect it from future supply gaps." Halliburton reportedly stockpiled four months' worth of guar gum, adding to the panic buying by others.

As *The Wall Street Journal* (December 5, 2012) reported, "US oil-services companies, worried that a drought in India would hurt guar output, began to stockpile the gum, which they buy from Indian processors or through commodity-trading companies like Connell Bros. Co., a division of Wilbur-Ellis Co. At the same time, India-based commodity speculators began to ramp up the price of the bean and gum on local futures markets." The WSJ writer called it "a classic bubble."

The bubble

Like many agricultural commodities, guar is overlain by an infrastructure of traders, bankers, speculators, exporters—all of whom were getting very rich on guar. According to *The Guardian*, as the price of guar was escalating in the summer of 2012, "one of India's biggest guar exporters, Vikas WSP, gave away 3,000 ton of guar seeds to encourage farmers to switch away from cotton and other crops to guar bushes."

Finally, India's commodity-markets regulator (the Forward Markets Commission) stepped in during late summer 2012 and suspended futures trading because of suspicions of "market manipulation." As globalresearch.ca reported (September 18, 2012), day-traders and rogue brokers were having such a guar speculating frenzy that "twice the size of annual production of the [actual] crop was traded in the futures markets on a single day." Other speculators were buying up and storing guar in warehouses (financed by private banks) to raise the price.

The FMC's market suspension, coupled with the massive stockpiling by US frackers, suddenly plunged the price of guar to about $7,000 per ton—a bursting of the bubble that meant many farmers who had taken out bank loans based on the high guar price were suddenly in trouble.

Nonetheless, with free seeds available from exporters, farmers in three Indian states increased their guar acreage by almost 30% in 2013, only to see another price bubble, and another crash, by November 2013, with the regulator again stepping in to investigate.

Given such a volatile market, the oil-services giants decided to make their own fracking guar substitutes.

Into the laboratory

Calgary-based Trican Well Services Ltd. touts its trademarked guar substitutes TriFrac-C and Novum, which the company's 2012 Annual Report says "have been field tested by Trican customers and results have been equivalent to or have exceeded guar-based systems."

Climate change is causing weather extremes that endanger India's guar crops.

Baker Hughes trademarked something called "AquaPerm," while Halliburton rolled out "PermStim," leading a business writer for *Reuters* (August 13, 2012) to note that they "sound like hair care products" but could be "a big prize for oil services companies as they try to stabilize costs." By 2013, Schlumberger was advertising its trademarked guar-substitute, "HiWay." Most of these laboratory sub-

stitutes use biodegradable polymers, thought to be more "green-friendly" than other chemicals.

But according to market trends analyst Thomasnet.com (May 9, 2013), "there isn't anything currently available with the reliability and quantities of guar gum." Others have noted that the industry likes to claim its proprietary fracking fluids contain common food ingredients, like guar. For example, the American Petroleum Institute's July 2014 report, "Hydraulic Fracturing: Unlocking America's Natural Gas Resources," uses images of a tube of lipstick and an ice cream bar (which both contain guar gum) as examples of the nonthreatening ingredients in fracking fluids.

By 2014, India's The Economic Times (February 6, 2014) was reporting that guar demand from the US oil/gas sector was again on the rise, with Halliburton and Baker Hughes "the two major buyers of India's guar gum." Whether that means PermStim and AquaPerm delivered less than stellar fracking results is not clear.

Ironically, however, increasing climate change is causing weather extremes that endanger India's guar crops—another form of volatility for the sector but this time by delayed, weakened, or heightened monsoon seasons. Many peasant farmers themselves, who profit little from the price increases, appear to be turning away from guar, apparently having lost faith in the economic "trickle-down" theory. A July 2014 "Guar Gum Report: India" from corporate advisor threeheadedlion.com quotes farmers saying they are less interested in growing guar. This year a delayed monsoon season was followed by intense monsoon flooding that wreaked havoc across India.

Perhaps fossil-fuel induced climate change will itself be the giant-slayer that brings down the fracking industry. Otherwise, maybe the Big Green NGOs could use their millions to provide free seeds for other crops and help India's peasant farmers transition away from guar.

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What Cuba Can Teach the World About Disease Control

by Conner Gorry

Cuba's commitment of 461 doctors and nurses to combat Ebola in West Africa is the largest single-country offer of healthcare workers to date to combat the crisis. But this is not the first example of Cuba's "unprecedented medical solidarity." Cuba has also sent medical teams to assist the peoples of Guatemala, Pakistan, Indonesia and Haiti in this past decade. And Cuba has a lot to teach the world about disaster relief and epidemic control.

Guatemala, Pakistan, Indonesia, Haiti. Four different nations that share a common experience: in the past decade, they were all struck by natural disasters which overwhelmed their understaffed and underfunded public health systems. Into the rubble, flooding and chaos of these distinct cultures and contexts Cuba dispatched a specialized disaster and epidemic control team to support local health providers. It was a story of unprecedented medical solidarity by a developing country which few media outlets picked up.

The Henry Reeve Brigade, as it's known, was established in 2005 by more than 1,500 Cuban health professionals trained in disaster medicine and infectious disease containment. Built on 40 years of medical aid experience, the volunteer team was outfitted with essential medicines and equipment and prepared to deploy to US regions ravaged by Hurricane Katrina (the offer was rejected by the Bush administration). Today, Cuba's Henry Reeve Brigade is the largest medical team on the ground in west Africa battling Ebola.

While United Nations Secretary-General Ban Ki-moon decried the pallid aid commitment from around the globe, calling for "a 20-fold resource mobilization and at least a 20-fold surge in assistance," Cuba already had 165 of these specially trained healthcare workers on the ground in Sierra Leone. Each of these volunteers, chosen from a pool of 15,000 candidates who stepped forward to serve in west Africa, has extensive disaster response experience.

Nevertheless, preparation for this mission required additional, rigorous training at Havana's Pedro Kourí Institute of Tropical Medicine with biosecurity experts from the United States and the Pan

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American Health Organization. This rapid mobilization of sorely needed health professionals begs the question: how can a poor developing country spare qualified, experienced doctors and nurses?

By pursuing a robust medical education strategy, coupled with a preventive, community-based approach, Cuba, a country of just 11.2 million inhabitants, has achieved a health picture on par with the world's most developed nations. This didn't happen overnight. Rather, Cuba's admirable health report card results from decades of honing a strategy designed specifically for a resource-scarce setting.

By locating primary care doctors in neighborhoods and emphasizing disease prevention, the