FORTUNE

JANUARY 29 2008: 4:15 AM EST

India's water shortage

Farmers are having a hard time finding ground water to grow their crops.

By Daniel Pepper, contributor

Punjab: Naresh Kumar, 22, crouches under a drill that will shortly bore 375 feet down to extract ground water to cultivate the local rice crop.

(Fortune) -- Just before dusk, on the plains of India's northern Punjab region, 22-year-old Naresh Kumar sprinkles mustard oil, turmeric, and raw sugar inside a ten-inch circle traced in the rich soil. Hands clasped, head bowed, he prays for a bountiful supply of ground water. Then he cranks a wheezing diesel engine, lines up a drill over the offerings, and releases a lever that brings an iron cylinder crashing into the earth. "Business is growing," says Kumar. "But we've placed about as many tube wells as we can in this area."

Indeed, the ground here in India's fertile breadbasket is beginning to look like Swiss cheese. On either side of Kumar's drill the calm beauty of emerald rice paddies belies a catastrophe brewing hundreds of feet beneath the surface. As the water table drops dangerously low, farmers are investing heavily - and often going into debt - to bore deeper wells and install more powerful pumps. A prayer might just be the best chance for survival.

Punjab has only 1.5 percent of India's land, but its output of rice and wheat accounts for 50 percent of the grain the government purchases to feed more than 400 million poor Indians. Experts say the 375-foot-deep tube well and 7.5-horsepower pump Kumar is installing for a farmer are at the eye of a storm that threatens India's food security, environmental health, and economic progress. "We have depleted the ground water to such an extent that it is devastating the country," says Gurdev Hira, an expert on soil and water at Punjab Agriculture

University in Ludhiana. Hira estimates that the energy used to subsidize rice production in the region costs $381 million a year. He and other experts warn that, if left unchecked, future drilling will bleed state budgets, parch aquifers, and run farmers out of business.

The problem is not only that farmers are mining aquifers faster than they can be replenished. As water levels drop, pumps are also sapping an already fragile and overtaxed electricity grid. And because farmers in Punjab pay nothing for electricity, they run their pumps with abandon, which further depletes the water table. "All these issues are interconnected," says Saurabh Kumar, who heads the government's Bureau of Energy Efficiency in New Delhi. "But agreeing on a simple thing is asking for the moon."

Environmental reforms

That's exactly what Kumar hopes to do: get politicians, farmers, and bureaucrats to sign on to reforms that will save billions of dollars and reduce the amount of water pumped out of the ground. A pilot program for his nationwide scheme is expected to launch early this year. Farmers will receive new, efficient pumps with meters and prepaid electricity credits allowing them to draw roughly the same amount of water they use now and either pocket the savings if they pump less or pay to pump more. Utilities will be required to upgrade transmission lines to cut losses and improve service.

The program comes at considerable cost (about $7.5 billion) but promises great savings ($2.2 billion a year). Unlike many experts who say the answer to India's water and energy problems is to charge farmers the real cost of electricity, Kumar argues that "for political reasons, for the next fifty years you cannot charge for energy in the agriculture sector. There would be riots."

Farmers like Darshan Singh, 55, who grows rice and wheat on 25 acres of Punjab land that has been in his family for generations, say they would be happy to pay for electricity if it was constant and didn't burn out their pumps. "Managing water is the biggest problem we have," says Singh, who has **91D 2** fingers on his thick hands. "This problem doesn't just have to do with farmers - it affects everyone."

The profusion of pumps and tube wells is also a result of a lack of infrastructure investment in rural areas. "No new irrigation potential has been created for about 20 years," says Mohan Guruswamy, who runs the Centre for Policy Alternatives in New Delhi. "The state prefers to dole out subsidies rather than make capital investments."

India's power sector loses as much as $9 billion a year subsidizing farmers' use of electric pumps. That's half of what the country spends on health and twice what it spends on education. Says Shreekant Gupta, a professor of economics at Delhi University: "It's a classic example of bad economic policies having serious environmental consequences."