

Feature

In Grips of a Silent Assassin

Pinjira Begum was once a happy wife and a proud mother of three. Then came the silent assassin and suddenly her world just fell apart. Years of exposure to arsenic contamination had taken its toll. Life became a nightmare. Helpless and virtually discarded by her husband and the family, Pinjira died. Pinjira's is just one of many such tragic tales, writes **Quamrul Islam Chowdhury**

DEATH came as a saviour for Pinjira Begum. The 26-year-old mother of three was a virtual outcast. Her husband had discarded her and got married again. It was not her fault, though. Quiet came the assassin, arsenic, and snatched away her happiness before stealing away her life.

When she finally gave in on May 10 this year after fighting an already lost battle for seven years, Pinjira's last wish was for her children's good health. Her husband was there a few feet away from her bed with his new bride. However, he could not give her any assurance, for Shapla, 10, their ten-year-old daughter has also become a victim of arsenic contamination. She is now worried about her brother Arif (7) and nine-month-old sister Juthi who are suffering from malnutrition.

Pinjira's husband Masudur Rahman (27), a rice mill worker at the remote village of north-western Bangladesh, 350 kilometres off the capital, is too poor to purchase arsenic kits and vitamin tablets for his family. Hanan Begum (Majid's sister) is an arsenic patient, is afflicted with the disease already hitting 10 of the 13-member family. They are not alone. A neighbour and a social worker Nargis (20) told members of Forum of Environmental Journalists of Bangladesh (FEJB) that the entire village is exposed to arsenic and nobody knows how to face it. Her father Nurul Alam Sarker (60) was among the ones who died.

Nargis said a number of arsenic-tainted tubewells have been sealed without providing an alternative source of pure drinking water. "Pinjira and my father were recovering after getting some treatment but they succumbed when local physicians stopped supplying vitamin tablets," Nargis told visiting journalists. She informed of about 400 arsenic patients in the village. UNICEF project officer M. Asadur Rahman said that they found 63 arsenic patients at Miapur. Mohammad Mohiuddin of CARE International based in Rajshahi said, "We cannot cope with the extent of arsenic contamination across the Rajshahi division. We are sensitizing the local people about some coping strategies like Solar disinfection of surface water by keeping water bottles whose one side is black 4-5 hours in 40-50 degree Celsius sunshine and freezing arsenic contaminated groundwater of bacteria by keeping it in a bottle for 3-4 hours with four drops of lemon."

Ishaq Ali, Superintendent Engineer of Department of Public Health Engineering Department (DPHE), Rajshahi centre conceded that DPHE is yet to cope with the magnitude of the problem and demand for sinking tubewells to replace the arsenic contaminated ones is also increasing. "We could sink only one test tubewell at Miapur and it is inadequate to meet the growing need for safe drinking water," he said.

Experts predict that if the problem is not addressed immediately and in right earnest, tens of thousands of people would be victims of the scourge of arsenic pollution within the next decade. The crisis is even being described as one of the world's most serious environmental problems.

The revelation of the existence of a high level of arsenic in the groundwater jeopardised years of efforts to ensure the supply of the cheap, safe and easy-to-fetch drinking water for millions in Bangladesh.

The news of an ever-growing number of arsenic victims and patients has set off a panic among users of tube-wells, the cheapest and primary source of drinking water for our rural

masses. It is reckoned that some 75 million people in 59 districts, are virtually exposed to the risk of becoming arsenic victims.

The arsenic's slow creep may affect different people differently. Some members of a family may be suffering but not showing any signs. Doctors suggest that nutrition could be a critical factor. Most people in Bangladeshi villages are malnourished.

The first signs are usually a darkening of the skin. Over a long period of time the arsenic breaks down the protein building body tissue, resulting in melanosis. Hideous warts appear all over the body. The hands and feet crack up and fester. At this stage, doctors say, there is no treatment for the poisoning. However, detected at an early stage the physical decay can be arrested.

And quite disquietingly, the bulk of our poor, illiterate rural people are still unaware of the magnitude of the problem; they have been virtually at a loss and do not know what to do.

Arsenic that contaminated

rural people. For nearly 25 years the Bangladesh government, with technical and financial assistance from those donor agencies, set about the task of sinking thousands of manually operated tube-wells across the country. Millions, four-millions to be precise, of those tube-wells were sunk. And then the authorities went about motivating the villagers to switch from using and drinking surface water to tube-well water, hand-pumped from the underground aquifers.

That had been a success story in the 70s and 80s in which Bangladesh achieved a near perfect target of providing safe water to its people through sinking those thousands of hand-pumped tube-wells. But now, with the revelation of the presence of the high level of arsenic in our groundwater, that success story is about to be reversed. When conceiving and implementing that massive tube-well programme, the planners had, overlooked the possibility of the naturally occurring arsenic deposits that could taint the subterranean

the country will have to be tested.

Giving an account of the problems relating to arsenic contamination in groundwater in Bangladesh, Dr. Babar Kabir of UNDP's South Asia Water and Sanitation Programme said 24 million people 59 districts were already affected by the problem. Quoting latest information presented at the co-ordination meeting of the National Arsenic Committee, he said that 7,000 people were identified as suffering from arsenicosis and another 75 million people are at risk. "Merely marking of red or green on tubewells in the rural areas will not solve the problem", Dr. Kabir said adding that the community should be allowed to decide their options to operate and maintain their water sources.

UNDP Assistant Resident Representative Shirin Kamal Sayed said the world body had come forward with the biggest global programme at a cost of 26 million US dollars to address various environmental issues, including arsenic prob-



Tell-tale signs of arsenic contamination

our ground water find their way into the bodies of millions of people as they drink from the thousands of tube wells spread throughout the country. The effects of drinking arsenic polluted water become visible only after years. Experts say that arsenic poisoning for 10 years or more can lead to several forms of cancer and result in many other deadly diseases. In other words, drinking such arsenic contaminated water is nothing but exposing the populace to a kind of slow poisoning that may culminate in death.

Quite paradoxically, the present crisis of arsenic contaminated groundwater is an unintended consequence of a countrywide programme of ensuring safe drinking water for our rural people. Let us recall the situation in rural Bangladesh decades ago when the only source of drinking water had been surface water.

Water is everything in agriculture. Until the 70s most villagers used to drink from hand-dug wells, ponds, canals or rivers, and often shared the water from those sources with animals. People in those days used to drink such highly polluted and bacteria-ridden surface water, exposing themselves to such endemic and deadly diseases like diarrhoea, dysentery and other intestinal diseases. Those water-borne diseases used to take a huge toll of human lives every year.

Then the authorities, in co-operation with UNICEF and other foreign and multilateral agencies, embarked upon a massive countrywide programme of ensuring safe drinking water, particularly for our

water sources.

Now, years after, as the alarm bell against arsenic presence in our groundwater has been rung, the queue of villagers at those tube-wells is shortening only to elongate the queue in front of health complexes across the country - by patients with different symptoms arising from drinking arsenic contaminated water.

Researchers surmise that arsenic bearing minerals rest in sediments washed down from the Himalayas over thousands of years. Heavy uses of tube wells have lowered the water table. As oxygen fills the gaps, a chemical reaction separates the arsenic from the minerals and seeps into the aquifers.

"Arsenic in drinking water poses the highest cancer risk ever found," says Dr. Alan Smith, epidemiologist at the University of Berkeley, California, who has visited Bangladesh several times as a WHO consultant. WHO standard for arsenic in water is a maximum of 0.01 milligrams per litre. But arsenic contamination in the water of Bangladesh's affected areas is five to ten times higher.

Today, tube-wells that once supplied pure and safe drinking water to our rural people, have been pumping poison. And what is strange about this problem is the fact that one pump may be giving out arsenic contaminated water while another, 10 feet away, may be giving out pure water. Researchers assume that this phenomenon could be due to variations in the underground rock and soil. Therefore each of the 3.5 to 4 million tube wells in operation throughout

lem - a national disaster in Bangladesh. She said the arsenic contamination was basically related to drinking water, which later manifested as a health hazard. The primary responsibility of providing safe drinking water to the people should be entrusted with the local government bodies or the public health department, the UNDP representative said.

Solutions are being sought, but considering the scale of the problem, not fast enough. Options include the possibility of harvesting rainwater. But what happens when there is no rain? Once Chlorine tablets were distributed, until it was shown that concentrations of Chlorine could be more dangerous than arsenic. There is an option for boiling surface water: but few villagers can afford the fuel.

The alarm bell has been rung, and there has been a nationwide awareness against the threats of arsenic contaminated water. It is for our researchers and policy makers to address the problem in right earnest and find out the quickest way to rid the country of arsenic pollution and mitigate the sufferings of its victims.

Dr. Iftekar Husain, Deputy Programme Director of Emergency Arsenic Contamination Mitigation Project of the Health and Family Welfare Ministry expressed his optimism that authorities can avert the trend and prevent as well as cure arsenic disease with the full execution of the project. The nation wants to realise Pinjira's dying wish by making Bangladesh an arsenic contamination free land.

— FEJB-SEMP Feature

Haunted by Bio-terror

The best weapon against any form of terrorism is to stop it before it even starts. This is especially true of bio-terror, for there is very little one can do afterwards, writes **Md Asadullah Khan**

A death warrant might sometimes come not from a battle equipped army but simply by an apparently unremarkable man striding briskly in a crowded city street. It may so happen that shouldering through the rush-hour traffic movement, he works his way to the edge of subway platform either in Tokyo, or New York, or London. Unnoticed by those around him, the man drops what appears to be a light bulb onto the tracks. The bulb shatters releasing a fine, smooth powder. The man takes to his heels but the catastrophe begins.

Moments later the incoming train pushes a huge column of air through the station, dispersing the tiny particles. Subsequent trains keep them circulating into sub-way cars — and into the lungs of tens of thousands of passengers. Within 48 hours many who either rode the subway or platform or the busy and crowded intersections at that particular time — may be hundreds or thousands — will feel unusually tired. Few will consult doctors about their commonplace flu like symptoms, muscle aches, fever, coughing mild chest pain. After another day or two, some people begin to improve. But their improvement, as experts suggest, will be temporary and brief. Suddenly they will crash and be panting for breath. The gasps will produce a sickening whistle. At this point lab work completed by their doctors, of course in a sophisticated and equipped hospital, say either in America, Japan or UK might identify the illness as something related to "Anthrax" release, a deadly bio-weapon now being produced in some countries either by terrorists or in some cases by government backed agencies.

If not treated within hours of the onset of the symptoms anthrax is almost always fatal. Less than two days after the symptoms worsen, more than 90 per cent of those infected will start to die — conceivably before authorities even realise that a terrorist has attacked. The assassin of course in many cases was vaccinated before the attack. And anthrax is a biological weapon that can wreak havoc on innocent people in any country. Biological weapons — most of them fine, respirable powders bearing deadly diseases are a real danger to all governments bearing hostility with each other. Anthrax is not the only threat.

More worrisome, small pox and bubonic plague are also being weaponised. Some health officials even fear that hemorrhagic fevers that have no vaccines and no cure, such as Ebola and Marburg may someday be used for terror.

Bio weapons are easy to carry and conceal. Days or even weeks may pass before their use is apparent. Pound for pound, they are deadlier than chemical or even nuclear weapons. The worst case scenario — 220 pounds of anthrax spores released from a crop-duster over Washington DC, on a calm clear night — could kill one million to three million people in the metropolitan area, according to the US office of Technology Assessment.... There was a spray dryer — essential for drying out bacteria so that they can be stored and then, when the time comes, dispersed efficiently. There were also four specialised filling machines, required for packing germ warfare agents into weapons or containers.

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to three million people in the metropolitan area, according to the US office of Technology Assessment. William Patrick, who served as a UN Inspector in Iraq, believes the scenario could take only 100 pounds of the agent. Evidence gathered by UNSCOM (the United Nations Special Commission on Iraq) reveal that Iraq had bought equipment useful for the production of biological weapons. There was a spray dryer — essential for drying out bacteria so that they can be stored and then, when the time comes, dispersed efficiently. There were also four specialised filling machines, required for packing germ warfare agents into weapons or containers. Iraqis claim to have destroyed their biological arsenal.

Few believe this to be true. Although, biological growth medium is used routinely in diagnostic tests in hospitals and also in research laboratories around the world, it rarely travels in containers larger than one kilogram. And when anything contrary to that is found anywhere, the motive must be called in question. The present world situation is charged with hostilities and open conflicts either in Kosovo, Bosnia or Afghanistan. With nuclear non-proliferation (CTBT) treaty partly enforced, the situation is ripe for other types of weapons coming into use. Colonel David Franz (Retired), former commander of the US Medical Research Institute of Infectious Diseases, believes "a mass casualty producing event" could occur in five to ten years.

This time the attackers could be Americans as well. According to a Defence Department Official conversation in some Internet chat rooms frequented by violence-prone members of militia movements proves that biological weapons are on participants' minds. Officials report on chilling discussions about how to use biological weapons such as ricin, a poison derived from castor beans, which starts to kill on contact. However, nobody contradicts the contention that making weapons that can inflict mass casualties takes the kind of facilities that probably only governments have.

Iraq now in suspect, many nations may have bio weapon facilities. The year after signing the biological weapons ban in 1972, the Soviet Union created an institution called "Biopreparat". According to defectors, this became a network of 20 facilities employing 15,000 workers and producing biological weapons such as anthrax and small pox. When the USSR broke up, the new Russian government cut funding for biowarfare. Reports have it that unemployed scientists are now peddling their expertise or even their products to the highest bidders, possibly including China, India or forces in Afghanistan. Defector Ken Alibek, once Biopreparat's top scientist revealed that he could not even speculate on where his former colleagues ended up or what they took with them when

they left. "Nobody knows where they are employed to-day", he says.

The agents of germ warfare, as these biological weapons are called, fall into two categories: infectious diseases and biological toxins. These are as described below:

Anthrax (Bacillus anthracis): This is a bacterium that infects mammals, including people. It occurs throughout the world including the Middle East, The Americas and the British did anthrax research in the 1940s. The Russians had an accident with anthrax in 1979, when it escaped from a military laboratory in Sverdlovsk and killed people and animals down wind. According to "Jane's Land-Based Air Defense 1997-98" book that is about to be published, the Russians have recently developed a strain of anthrax that is resistant to antibiotics. According to experts, if anthrax spores are inhaled, they cause a swift and grisly death. The unfortunate victim suffers a toxic shock sometimes within 24 hours of exposure.

Botulism toxin: This is produced by the bacterium "Clostridium botulinum". It is one of the most lethal substances known, killing by causing acute muscular paralysis.

Experts painfully explain that in the event of a major biological attack, no city in America even has the beds or medical staff to handle the numbers who would be affected. Experts admit that even US planning for an attack with a contagious agent such as smallpox is particularly weak. In 1972, after disappearing from Yugoslavia for four decades, smallpox broke out. Yugoslavia then did not contain the epidemic with a quarantine alone, it also vaccinated the whole country using vaccine supplied by the World Health Organisation. Experts in the US are afraid if the US is attacked with smallpox and suddenly needs to vaccinate again, it will run short of usable doses of vaccine for approximately 270 million people.

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The incubation period, and prognosis both depend on the dose ingested. Symptoms like blurred vision, difficulty in breathing and swallowing, muscle paralysis can set in within four hours and in almost 60 per cent of cases death follows swiftly.

Alatodxin: It is a poison that is usually found in foods (especially peanuts) that have been contaminated by a particular fungus. Its most serious known effect is liver cancer about 10-15 years after exposure. As such it is not exactly a shock anti-personnel weapon.

Gas gangrene: Caused by the bacterium "Clostridium perfringens", gas gangrene is a particularly nasty condition. The bacteria release toxins that cause the amputation of limbs.

Wheat cover smut: A fungal infection of wheat and other cereals, wheat cover smut renders crops inedible. In some countries, contaminated crops were grown and harvested but the project, it is learnt, did not add to people's woes.

Ricin: As already mentioned, derived from castor bean plants, ricin is a powerful toxin. When inhaled, it causes an immediate break-down of the lung tissue, resulting in hemorrhagic pneumonia and death.

Viruses: In 1990, work in some countries was apparently started on three viruses - haemorrhagic conjunctivitis virus, rotavirus and camel pox. The first of the three inflicts pain and temporary blindness. The second causes severe diarrhoea which can lead to dehydration and death. The third rarely affects people.

Ebola virus: Ebola virus is diagnosed with symptoms of fever, sore throat, diarrhea, vomiting, limited kidney and liver functions, external and internal bleeding. There is possibly no

known treatment and death comes in almost 50 per cent of cases.

Smallpox: This virus attacks people with symptoms like fever, skin blisters, bleeding mucous membranes. There is no known treatment and death comes in almost 33 per cent of cases. Sadly enough, in an unannounced attack, says US-AMRIID's (US Army Medical Research Institute of Infectious Diseases) Peter Jahrling, "No one will know anything has happened until patients start showing up at the hospital". Samples must be taken from the sick for identification and submitted for laboratory analysis. Only two labs in the United States — USAMRIID in Fort Detrick, Maryland and the CDC (Centre for Disease Control) in Atlanta — are equipped to test for the full range of diseases such as anthrax and smallpox. Without special training and more equipment it will be hard to add to the list, says Dr D A Henderson of John Hopkins University's School of Public Health. The testing is "an art", Henderson explains. If you are not used to doing it regularly, you can get strange results.

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Bangladesh Embassy in Brussels is fully aware of developments in Belgium. It is believed that Bangladesh import livestock feed or ingredients from Belgium. Also other food items, banned by the Belgian government and European Commission, are imported.

Thus, Bangladesh government should immediately trace such imported items in Bangladesh as produced in Belgium, the Netherlands and France, between January and early June this year, and take precautionary measures. Livestock feed, that either has already been imported or are in the process of entering the country, should be totally destroyed.

Bangladesh government has quite a task in hand. Dioxins are difficult to analyse. One sample costs about 1,200 US dollar to test and very few facilities for such testing exist in the country. So, Bangladesh should rely on secondary information, and considering public health risks, should intervene without further delay, whether the Embassy officials advise or not.

The author lives in Brussels.

Dealing with Deadly Dioxin

High levels of dioxin, a probable human carcinogen, detected in Belgium dairy and poultry products has sparked off a world-wide food scare. **Ahmed Ziauddin** traces the origin of the dioxin dread

FOOD, and in particular food safety, has been very much on Belgian minds lately. In quick succession, Belgium has recently been hit by food contamination scare to such an extent that many have begun to wonder if there's going to be anything edible.

First came worries of the mad cow disease, which caused havoc to British cattle farms. Next came the menace of swine fever and tranquillizers in pork followed by the discovery of illegal use of growth hormones in beef that even led to the assassination of an inspector — too many scandals related to food that scared consumers and made them sceptical.

The country is currently reeling under two major food scares, poultry, pork and Coca-Cola. In both cases, the government was compelled to impose ban on sale causing enormous loss to farmers and others. The assessment of loss has not been complete yet. However, the political disasters brought about directly by these horrifying revelations have seen two ministers resign, and the incumbent Prime Minister defeated in the general election held on June 13.

In March, in a farm in Belgium's Flemish region (Belgium is divided into four regions based on the language of

its inhabitants — Flemish, French, German regions, and Brussels region, which is bilingual), farmers began to notice weird things happenings in their farms; eggs were not hatching and the birds were going lame.

An insurance company engaged an independent expert to investigate, and poultry feed was suspected to be responsible, especially processed fats used in feed.

In April, a laying hen and a feed sample were sent for examination to Dutch State Institute for Quality Control, which confirmed the presence of unusual amount of PCB (Polychlorinated biphenyl) and dioxin. Further examination conducted again on two chickens and two eggs produced in April provided conclusive answers. The results showed that the chicken fats contained 958 and 775 parts per trillion (ppt) dioxins respectively.

PCB and dioxin are compound chemicals. Dioxin is considered to be a cancer causing element. It also affects reproductive, immune and thyroid systems. Experiments of dioxins carried out in Belgian University have shown its carcinogenic effects on monkeys. Pregnant women are especially vulnerable since dioxin can cross placenta.

In March, following initial investigations, the Ministry of Agriculture was notified that poultry feed was the source of dioxin contamination. The manufacturers of such feed were identified, and one of the major producers of the contaminated feed was Verkest, a company based in Gent, a Belgian town.

The company produces poultry and animal feed using animal fats. According to latest news reports, the fats so used were produced in companies in the French region of Belgium. The fats were reprocessed animal fats that also used reprocessed machine oil.

News reports suggest, an 80-ton batch of recycled fat was contaminated with about eight litres of pure PCB oil, of the type used in industrial electrical transformers. This was added to a batch of feed and sent to over 1,000 farms, where it was fed to livestock, mainly chickens, pigs and cattle.

The government did not make public disclosure of the contamination. As the media leaked the news, the government dithered. It was only in May that Health Minister Marcel Colla advised retailers not to sell a host of products.

The ban included all products from poultry bred in Belgium since January 15, 1999: foods containing poultry meat, such as soups, stock cubes, ready-made meals, salads, charcuterie, chicken-based snacks; foods containing over 2 per cent egg or egg derivatives, like mayonnaise and salad dressings, salads containing mayonnaise, crepes, flans, pastries, brioche, fruit cake, waffles, sponge fingers, ready-made meals (fresh, frozen or tinned), prepared mince, pasta containing egg, tiramisu, zabaglione, biscuit, foods which might contain egg,

such as, rice pudding, mousse/custard desserts, baby food; pork and beef products, namely, mince, sausage, meatloaf, bacon, pate, salami, liver, pork fat, beef fat, black/white pudding, and butter and dairy products containing 25 per cent of fat.

There were immediate public uproar as to why the government had been sitting on such deadly findings while contaminated foods were being consumed daily.

According to one estimate, if all the chickens and eggs contained 900 ppt dioxin in their fat, people eating a typical Belgian diet would have received 40 times the World Health Organisation's recommended maximum dose of dioxins per day as long as the contamination lasted. If effects of PCBs and the daily toxicity are added, the limit could have been exceeded 100 fold.

The consumers have more

questions than they could find answers to. Questions were raised about the battered chickens, the way poultry are produced, in large farms, by extremely unnatural and mechanical way. A chicken never sees daylight, and for the producers, the birds are nothing more than machines to produce eggs, and source of meat.

Probing questions were also asked about the poultry feed, as to why the chicken, pork and cattle are fed with animal substance, instead of grass and vegetable. Many believed that tampering with nature would inevitably bring such disasters.

Questions also remained about the health consequences of such mass contamination. As the extent of contamination unfolded gradually, most of the produce are believed to have already been consumed.

The scientists believe babies in the womb and very young children are most at risk. While

scientists suspect that the doses of dioxins people received in this incident will be too low to cause cancer; lower doses, nonetheless, might affect the nervous system and behavioural development and can interfere with the immune system and with thyroid and steroid hormones.

There has already been claims by scientists the Belgian authorities must collect as much food as possible produced during the affected period to find out the level of contamination, where it occurred and for how long.

Having estimated the dose, scientists believe that mechanism should be put in place to follow the affected people medically for the next decade or more to observe the effect on their health.

The question is whether the government is at all doing it now or intends to do it any time soon.

Food and livestock are big business, and as a matter of fact, business interests often get preference, and that is the scary part.

Finally, questions have been raised about how much consumers should trust food safety on government's certification, which is visibly under pressure from the food industry.