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The Price of Life

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ABSTRACT*: Arsenic contamination of groundwater was detected in West Bengal, India, in the 1980s. Thirty years and several mitigation efforts down the line the medical impact of arsenic is well-documented. However, the socio-economic impact caused by the catastrophe is yet considered variable. In Murshidabad district, West Bengal, one of the worst-affected districts, arsenic is not only causing deaths but also forcing affected families into a vicious cycle of inter-generational poverty. The true evaluation of the losses caused by the endemic is necessary for successfully mitigating the crisis. The representative loss caused by arsenic contamination of groundwater can only be arrived at by making a cumulative aggregate of losses accounted for by the different methods of Adaptive method, Averting method, Travel-cost method and Hidden cost method. It also puts into perspective the enormity of the crisis and the need for putting in place appropriate holistic, mitigation efforts. In Murshidabad, finding sustainable solutions to the arsenic crisis is imperative for attainment of MDGs.*

Keywords: *Groundwater Arsenic Contamination; Murshidabad District; West Bengal; Adaptive method; Averting method; Travel-cost method; Hidden cost method; Vicious cycle of poverty*

I. INTRODUCTION

Annals of Indian history are abounding with folklores about poison damsels or 'Vish Kanyas'. These girls, according to those legends, were fed a steady dose of poison since their birth. The ritual followed the tenets of Mithridatism, i.e. the practice of protecting oneself against a poison by gradually self-administering non-lethal amounts. The legends further claimed that these girls grew up to be so venomous that any form of sexual encounter with them was good enough to claim life (Chaurasia, 2002). These damsels, probably the first example of suicide bombers, were important tools to destroy powerful enemies.

However, those legends do not throw much light on the impact the poison had on the health of these damsels. There are, at best, informed suggestions that many of them were in distress and subsequently perished. It seems unlikely that we will be able to decipher their end, conclusively. But given the demise met by present-day subjects who are exposed to involuntary poisoning from an early age, a sad, slow, excruciating and untimely death seems the most likely eventuality.

In the Indian state of West Bengal, one can find several millions of such unwilling sufferers. They are all victims of arsenic contamination of groundwater, arguably one of the worst present-day calamities (Chakraborti et al, 2004; Ahmed et al, 2007). They consume their daily dose of poison every time they quench their thirst. However, the crisis is not limited to West Bengal. Significant segment of the Gangetic delta, consisting parts of India and Bangladesh, is worst–affected. In fact, the extent of the crisis has a global footprint (Sarkar et al, 2010). In a striking similarity to the case of 'Vish Kanyas', the source of poison, i.e. water and its delivery is a state responsibility in many nations. In fact, it is a right acknowledged by United Nations under General Comment number 15. The comment specifies, "The human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic use". It is now proven that making 'safe' water accessible at the end user point is an essential service that is necessary for maintaining satisfactory public health standard and higher level of human well being.

The initiation of usage of groundwater for drinking water purposes in West Bengal was promoted to save the population from waterborne diseases like diarrhea, dysentery, jaundice, dengue, malaria, and typhoid amongst others. Groundwater, safe from microbial impurities was considered the most appropriate solution. However, the shift brought about disastrous consequences for people living in regions bearing arsenic in aquifers. The safe water started yielding poison and life on the plains was severely compromised. Long-term exposure of arsenic through ingestion can lead to several health complications. Significant among those are

reduced intelligence in children, dermatologic, neurologic, vascular, and carcinogenic effects that can result in amputations or even death (Das, 2011).

Today it is accepted that eight districts of West Bengal have arsenic levels in ground water above the national permissible limit of 50µg/L. These districts are Nadia, Murshidabad, Malda, North and South 24-Parganas, Howrah, Hooghly and Burdwan (Das, 2011). Murshidabad according to the Ministry of Panchayati Raj, Government of India, is one of the most backward districts of the nations and has an average arsenic concentration of 240 µg/l in tube-wells. The minimum and maximum arsenic concentration levels are 3 µg/l and 3000 µg/l respectively (Das, 2011). And it is here the real impact of arsenic is apparent. It is far severe than the apparent health complications. It has been proved that water borne diseases dampen economic growth and worsen poverty status for developing nations. In fact, for India to realize its sustainable development agenda she needs to assure safe water supply for its citizens (Roy 2008). In the case of Murshidabad, 64.53% of the total area and 68.13% of the total population of the district is under the eminent threat of arsenic (PHED, 2001). In this district arsenic is hindering possibilities of achievement of Millennium Development Goals (MDGs). It is making sure that development programs do not produce optimal results even after adequate investment. It is damaging the human capital of the district severely, and almost irreversibly. It is causing a silent genocide and also forcing migration.

II. MANIFESTATIONS OF THE DISASTER

Arsenic is yet to be incorporated into the disease surveillance program. Therefore, even after approximately thirty years since its discovery, the Burden of Disease (BoD) for arsenic is unknown. The affected gets to know of the poison only after entering the 'Clinical Stage' of the disease, i.e. when they exhibit skin manifestations (Saha, 1998). In the 'Preclinical Stage' the patient usually shows high concentration of arsenic in clinical examination but no external symptoms. By the time the affected starts seeking medical advice, the disease has started draining out his ability to work considerably. It seems arsenic slowly sucks the life force out of the affected and with it his only available capital, at least in most of the poverty stricken regions of Murshidabad, i.e. his ability to labor. Inability to work means less income; cost of treatment means greater expenditure – caught in this dilemma the patient suffers severe mental trauma. At times, various forms of social exclusion and stigma add to the trauma. The well-being of not only an individual but also their families gets compromised. Subsequently, when the lion's share of the population in a community is under arsenic induced stress, as in the case of Murshidabad, the entire locality, or in this case the district, regresses steadily. The cost of staying alive simply takes the centre-stage and makes all probability of human capital development redundant. In this paper we examine the costs sufferers and their families pay to stay alive. The findings are basis Focus Group Discussions and Case Studies conducted by us during the district level field surveys since 2007.

III. THE TRAVEL COST OF SAFE WATER SOURCING

The primary instinct of those affected is to prevent further aggravation of the disease. To that end, securing safe drinking water is the obvious spontaneous decision. But to seek safe water in a district where 64.53% of the total area is reeling under the contamination is no cakewalk. Women being the traditional water providers bear the greatest burden of this inconvenience. Globally it is estimated that women and girls in low-income countries spend 40 billion hours every year on account of fetching and carrying safe water from far-away sources (Blagborough, 2001). It has been proved that when women and girls have easy access to a clean water supply, girl children lose less school time (WSSCC, 2004). In Murshidabad these findings get substantiated with ominous frequencies.

In Khairamari village of Jalangi block in Murshidabad, Mrs. Nazima Khatun has already lost three members of her family due to arsenic induced diseases. When the tell-tale signs of arsenic poisoning appeared on her son's body, she decided to visit Kolkata in search of better treatment. The doctors at West Bengal's premier, super-specialty medical facility Seth Sukhlal Karnani Memorial (SSKM) hospital, Kolkata, categorically told her that the only available cure for arsenic induced illnesses is consumption of safe drinking water. And that's when Nazima's ordeal reached the next level.

Nazima belonging to a well-to-do family had the convenience of having a tube-well within the confines of her boundary. In fact, people from the locality came to their house to collect water. Arsenic level in that tube-well was way past the permissible limit and the principle culprit for her agonies. She stopped using water from the tube-well. Driven by the desire to keep her son alive Nazima started taking arduous journeys to the

government established deep tube-well some 5 kilometers away. The trip took 2 hours of her invaluable time. In Nazima's village all-weather roads are yet to become a reality. That meant, she had to walk over undulated terrains carrying heavy water filled vessels. In 2011, on a typically rainy and gusty evening, she slipped. The fall hurt her back, bad. But she was adamant that safe water must be sourced. Therefore her eldest daughter was allocated this extremely important and potentially life-saving responsibility. Nazima had a choice, sending her daughter to school or saving her son and the rest of the family. Nazima did not take long to make it. Today, her daughter performs this daily ordeal of collecting safe water. She is into her teens and at times faces other kinds of traumas during this rigorous daily exercise. But she does not have a choice to not go. In fact, she is worried that who will collect the water once she will get married.

Mr. Alauddin Sarkar, of Panjapara village in the same block, has had a similar fate. He has distinct spots all over his body. He cloaks those with clothes. But those on the palms and soles need regular laceration. But even this painful exercise does not allow him much relief. He can't even walk barefoot, let alone the possibility of seeking employment. Mr. Sarkar considers the tube-well his personal enemy. During our visit his anger simply seethed over. He said, "We don't think of arsenic anymore. What will change by thinking about it?" Yet he has no option than to draw water from the same. He has been informed that water from a dug-well will be arsenic safe. But he has no means of acting on the basis of this information. In fact, he can barely make two ends meet. He has resigned to his fate. But he hopes that safe drinking water will be available for the future generations. His hope has been resting on the government to make this dream come true. So far, it has not reached fruition.

Srikrishnapur village is situated in Domkal block, Murshidabad. It is adjacent to Jalangi block. Sometime around the year 1997 the first death due to arsenic ingestion was reported from this village. However because there are no official reports the claim cannot be verified. Mr. Bellal Mondal presently residing here and having severe manifestations of arsenic induced illnesses recalls the physical symptoms of the deceased and finds those to bear striking similarity to those emerging on his own body. Somewhere deep inside, Mr. Mondal knows that his count to the end has also started. He is, for obvious reasons, afraid. Since 1997 Bellal has done all that he could have done to stay alive. He has undergone treatment, fruitlessly. Compelled by his fear, he has gone to the Village Pradhan, the Block Officer, and whoever else who may have offered any sort of solution to his crisis. He has even tried to source water from a far-off tube-well. But as the disease got the better of both Bellal and his wife they can't undertake the rigorous task anymore. They have no resource to pay someone to avail the services. No source of safe drinking water is yet to reach his village. All his efforts have added up to nothing.

IV. THE ADAPTING COST ON ACCOUNT OF MEDICAL EXPENDITURES

The development of arsenic clinic in SSKM Hospital, Kolkata was one of the rare highlights in the mitigation efforts of the crisis from the medical perspective. The clinic started operation in 1997. The program was abandoned in 2009. During this brief stint it advised patients, doctors and medical staff alike on all probable mitigation possibilities. But the message, it seems, has been lost, already. In this context it might be worthwhile to revisit the act of discovery of arsenic in groundwater in West Bengal during the early 1980s. The discovery is credited to Dr. K C Saha, the then head of Dermatology division in School of Tropical Medicine, Kolkata. Dr. Saha stumbled upon few patients with unusual skin manifestations and ordered a scrutiny of the water they were consuming. The laboratory, another government establishment, considered this diagnosis ridiculous. However, the test results proved that Dr. Saha's hunch was right. Arsenic in those samples was ten times more than the acceptable standards. The factor of chance is still paramount in all medical diagnosis at least in the poverty-stricken district of Murshidabad. In fact, the Chief Medical Health Officer (CMOH) of Jalangi block goes on record to say that there are no patients suffering from arsenic induced illnesses in his block. The reports or the lack of it, for adjacent Domkal block also point towards the same conclusion. However, our field visits reflected a different reality.

Public Health Engineering Department (PHED), Government of West Bengal (GoWB), in its 'Report Based On Water Quality Survey During 2002-2006 Under The Joint Plan of Action With UNICEF' declared 36.69% of tube-wells in Domkal to be affected by arsenic contamination of groundwater (PHED, 2007). In simple terms, it meant that drinking water from the contaminated tube-wells in Domkal block was like consuming poison, in small doses. And that is what Mr. Sonaullah Molla of Srikrishnapur village of Domkal block did for approximately 25 years of his life! Inevitably he was diagnosed with cancer of liver. But Sonaullah

had the wherewithal to struggle for his life. He went to Kolkata to avail the relative luxury of receiving proper medical attention.

He made the arduous 6 hours and 250 odd kilometers long journey on a rickety bus to SSKM Hospital, Kolkata. The road, wherever existed, was bad. The one-way fare was a mere Rs. 100 for each individual. Or was it not? After all, Mr. Molla was a small farmer whose yearly income barely added up to Rs. 10000. This meant he fell marginally below the official Poverty Line Index of Rs. 28 a day.

But lack of financial resource or reserve could not belittle his epic struggle to save his soul. He sold off the last inch of his landed property and got hold of a princely sum of Rs. 1 lac, or equivalent to 10 years of his earning. But that was not going to be enough. He visited SSKM 10 times in the following years. Most of the times, he had to return without meeting the doctor. At times, he was advised to inject a medicine which had to be bought for Rs. 700. The scheme for free medicine for the arsenic affected did not come to his aid either. He had to procure the medicines from private shops. He is no more today. His ordeal has ended. But for his family it has taken on an even sinister complexion. All possibilities of a decent survival, it seems, for them are simply impossible. Devoid of any landed property or even the ability to toil in the fields have turned them into zombies. As if to expedite the eventuality, they continue to drink water from the same tube-well and the symptoms of arsenic induced illnesses have become visible in quite a few of them.

Hazrat Ali, his neighbor, has a similar story to narrate. Inspired by Sonaullah, he spent a day waiting for the doctor at SSKM hospital, Kolkata. His condition of employment stipulated pay only for work done. Therefore, in the bargain, he let go also of a day's wage. Not overwhelmed by the situation he decided to spend the night in front of the hospital. However, he failed to consult the doctor even on the next day. He had to break his resolve. He returned from Kolkata and since then has not been able to visit again. Loss of two days of wage was something he can't afford anymore.

In the context of arsenic poisoning in Murshidabad, the words of R Srinivasan, 'Health care covers not merely medical care but also all aspects of preventive care too,' sounds ominous (Srinivasan, 2004). The victims of arsenic poisoning choose to visit doctors only when they enter the 'Clinical Stage' or beyond of the disease. Essentially, the irreversible process of death has already begun in the patients while they visit medical facilities. Though they try to prolong the inevitable by opting for surgical procedures or ease the discomfort by applying external medications, in effect, they do not have much chance.

V. THE AVERTING COST ON ACCOUNT OF WATER PURIFIERS

Arsenic contamination of groundwater affects the poorest of the poor. Yet its remedial measures are rather cost intensive. The Government of West Bengal has spent `1817.32 crores towards arsenic mitigation measures and supplied safe water to 62.41% of the total risk population (PHED). It is also working to ensure piped water supply for 16.59 million of population at risk at the estimated cost of ` 2503.64 crores by the year 2011 (PHED). There have been other schemes for supply of domestic as well as community based arsenic purification filters. For the past three decades in the name of arsenic mitigation efforts in India, the emphasis has been on devising appropriate arsenic-removal process–technologies. In socio-economic terms the interventions followed the expenditure model which does not take into account the sustainability of the effort (Roy and Das, 2009). It was assumed that supply will give rise to demand! Unfortunately, that has not been the case. That's why in rural West Bengal and Bangladesh less than 1% of the exposed population has access to arsenic-remediated drinking water (Gadgil et al., 2012). Field observations reveal that most of the arsenic removal systems are defunct (Das, 2011).

In Debipur village of Jalangi block various arsenic removal filtration systems were supplied by several organizations. At the time of field visit, we came across seven such filters in the locality. However, with eleven reported deaths in the locality and several more seriously affected, it may be concluded that the safe water supply was not available. In fact, piped water supply had also reached the village in 2011 after remarkable persistency shown by its residents. But the joy of having a safe water supply was short lived. The water pipes have been damaged due to widening of roads in the region. The defunct connection now lies hidden somewhere under several layers of dirt and asphalt. The residents of Debipur have paid the ultimate price of development. They are unsure when the connection will be restored again.

In the same village we met Mr. Ashok Roy during our visit in 2007. He was a well-to-do businessman and had the ability to invest in domestic water filters. However all popular products in the market were unable to

successfully filter arsenic. During our most recent visit we came to know of his sad demise. He is survived by his wife and two children. They now live in abject poverty. Ashok's investment into filter did not save his costs for medical treatment. On the other hand UNICEF promoted arsenic removal filters available for as little as ` 550 lie in stacks of waste in the backside of Jalangi Block Development Officer's office.

In Debipur village, our field observations indicate, that investments made by the state as well as affected individuals have become sunk. These expenditures have not yielded value for the intended beneficiaries and in fact have become burdens on the exchequer in the form of non-performing assets. In the socio-economic context of Murshidabad these incremental losses have exacerbated the day-to-day struggle of the affected to stay alive. On one hand they have made unwise investments based on improper information, on the other they have been robbed of benefits of development programs due to improper planning and execution.

They have been sucked into the vicious cycle of poverty by making continual losses on all accounts of avoidance, averting as well as travel costs. Their ownership of low resources coupled with their lessening capability to perform has ensured that the true impact of arsenic contamination of groundwater becomes inter-generational. Death of the first affected is merely a milestone in the process of engulfing of the entire family into a trap of all-consuming poverty. In fact, the impact of arsenic goes beyond mere resource poverty. It also has several psycho-social implications.

VI. THE HIDDEN COST ON ACCOUNT OF SOCIAL COST OF EXCLUSIVITY

"Social exclusion is about more than income poverty. It is a short-hand term for what can happen when people or areas face a combination of linked problems, such as unemployment, discrimination, poor skills, low incomes, poor housing, high crime and family breakdown. These problems are linked and mutually reinforcing" (SEU, 2004).

Mr. Ashadul and Obaidul Shekh live in Amirabad village of Raninagar – II block of Murshidabad. They have substantial amount of agricultural land but their household bear the distinct mark of abject poverty. Both the brothers are arsenic affected and cannot labor in the field enough to revive their financial status. They have not been in a situation to employ enough agricultural hands due to previous year's bad crop and the losses due to it. Both of them exhibit visible lacerations on their bodies which ooze body fluids and at times even blood. The ghastly sight is probably yet another reason why laborers find it difficult to work alongside them.

For Jiauddin Shekh of Harekrishnapur village, Jalangi block social stigma has risen to the next level. He was a trained craftsman, earning respectably before the onset of arsenic induced illnesses. The diseases crippled his efficiency, significantly. With the hope of reclaiming his life and livelihood, Jiauddin got himself admitted to SSKM hospital, Kolkata. The treatment saved his life but rendered him invalid for life. His right hand, from the elbow onwards, had to be amputated. The surgery, an expensive one by his standards, marked the beginning of his end.

Today, Mr. Saikh's wife, Janera Bibi, is the mainstay of the family. Her income as a cook in a school under the Mid Day Meal Scheme is helping the family scrape a living. But all is not well with her either. She had taken a substantial amount as loan, principally from neighbors, for the treatment of Jiauddin. The loan sits heavy on her mind and has resulted in bouts of depression and severe anxiety. But the most significant cause of worry for the couple is the uncertainty that looms over the future of their beloved daughter. They don't know where from the money for her education will come. They are uncertain whether they will have enough money to marry her off honorably. They are not even sure whether she will have suitable suitors now that the arsenic catastrophe of Harekrishnapur is public. They don't know whether she will ever have a decent life. And as parents, they hate to have not secured her future.

Mr. Jorabul Islam of Khidirpara village of Domkal block chose in favor of leaving the village rather than dying a gradual death. His son now earns his living as a daily wage laborer in the Indian state of Madhya Pradesh. Jorabul was afraid that his son may die by living in the village. He chose periodic separation with his son a more viable option than losing him for good. He wishes his son never comes back to the village. Mr. Lalan Mondal, a resident of the same village, belongs to an arsenic affected family. His family's financial constraints due to arsenic induced poverty meant that he had to leave school in his teens. Subsequently he shifted to Goa, India in search of a livelihood. Presently based out of Kerala, India he dreads the prospect of visiting his village. However he still instills the courage and come calling for few days each year. He says, 'not staying near your loved ones is bearable. Death is not.' In several villages of Murshidabad arsenic has forced many to leave the security of their homes. In Khidirpara more than 70% of all households have at least one member living outside

the state. The money they send home is keeping their families alive, literally. However, ironically, due to lack of earning capacity they are unable to shift their entire families out of the district. And whatever money they are sending back is exhausted on account of healthcare or in search of safe water sources and not on asset building.

VII. CONCLUSION

The Price of Life is an effort to figure out the constituents that define the representative cost of arsenic contamination of groundwater. The paper is limited in scope and ability due to its small sample size. The findings and observations are based on the field surveys in Murshidabad district but are comparable for other arsenic affected districts. Taking forward the idea, an arsenic mitigation cost-benefit index may be prepared which accounts for the representative cost burden of the disease according to the different methods, namely, Adaptive method, Averting method, Travel-cost method and Hidden cost method. This may in turn help us rethink the way development programs are initiated presently. It may bring an end to programs following the top-down expenditure model and usher in an era of inclusive growth fuelled by community participation and empowerment. It may also help the process of interdependent decision-making on behalf of various agencies in charge of mitigating any future crisis.

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