



Building Resilience through Promoting Safe drinking water in flood prone districts of Bihar

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In a country like India, rural areas are especially prone to the dangers of contaminated water. This is due to insufficient knowledge about water quality, contaminants as well as lack awareness of means of cleaning or filtration. The India Water Partnership (IWP) aims to tackle both these problems simultaneously as they educate villagers and also provide a low-cost, easy-to-maintain water filter as well. Here, they discuss their journey to promote safe drinking water in Bihar so far and briefly touch upon their plans for the future.

SAFE DRINKING WATER

Safe drinking water, a basic amenity, has today become a luxury in many Indian households, especially in semi-urban and rural areas. However, India is ranked among the worst countries in the world for the number of people without safe water. An estimated 63 million people in India have no access to a safe water supply and the situation is getting more serious. Around 37.7 million Indians are affected by waterborne diseases annually and 1.5 million children are estimated to die of diarrhoea alone. A report by UNICEF and FAO states that, "45 per cent of India's children are stunted and 6 lakh children under five die each year, largely because of inadequate water supply and poor sanitation". As a result, India loses 90 million work days per year due to the increase in exposure to waterborne disease and ill-health.

Despite technological advancements, and centralised & decentralised solutions, the problem of safe drinking water at household level still persists. This disconnect between the accessibility and existence of solutions especially in rural areas can be majorly attributed to lack of understanding of the people about the importance of safe drinking water. Water-related diseases put an economic burden on both the household and the nation's economy. At household levels, the economic loss includes cost of treatment and wage loss during sickness. And in turn, loss of working days affects national productivity. This compels us to re-think and re-strategise our approach towards providing safe drinking water and increasing access to safe drinking water. One of the major challenges is to make people clear on the definition of safe water and aware of the need to consume safe water.

There is a need to promote sanitary inspection along with community based water quality monitoring and surveillance at the grass root level. Thus, the India Water Partnership (IWP) is working on stimulating behavioural change of communities in the villages of Samastipur and East Champaran Districts of Bihar along with offering them a socio-economically viable and low maintenance solution in the form of JalKap filter.

HOUSEHOLD WATER TREATMENT AND STORAGE (HWTS)

HWT technology is deployed to treat water just before consumption by the user is a proven, self-sustainable and low-cost intervention to provide safe drinking water and help to reduce diarrheal incidences in low and middle range economic groups. These are preferred to eliminate the secondary risk of contamination. Hence, India Water Partnership (IWP) is engaged in promoting safe drinking water in rural communities of Bihar by generating awareness among people about the linkage between drinking water and health, while simultaneously offering them alternatives to prevent contamination at various steps of the ladder. Household water treatment



technologies hold an edge as they minimise the chances of secondary infections.

IWP has been working in this regard with their implementing partner SM Sehgal Foundation based in Gurgaon. The project is being implemented in 57 villages of East Champaran and Samastipur Districts of Bihar. Bihar is most flood prone state and hit by huge floods every year. These floods have been affecting the water quality of the ground and surface water of the state. For these districts Samastipur and East Champaran, like several others, groundwater remains the major source of drinking water with arsenic in a few of its pockets and high levels of iron and biological contamination. Because of lack of awareness communities, particularly in rural areas, keep suffering from waterborne diseases.

Considering the long term effects of arsenic and immediate life threatening challenges posed by biological contamination, it is wise to sensitise communities about water risks, build awareness and demonstrate treatment options so that households can adopt them. The project, which was started in August 2016 by IWP in collaboration with implementing partner S M Sehgal Foundation with a National level training on HWTS has been successful in training 1,752 males and 843 females on Household Water Treatment and Storage (HWTS) and also empowered them in using field testing kits to test water at the ground level. More than 600 households have adopted the JalKap Filter till date.

BIO SAND FILTER-A LOW COST SOLUTION

In rural areas, modern water purification technologies might not

be viable. In villages, it is important that simple technologies that are easy to use and can be operated without much technical 'know-how' be promoted. The price factor is also important as technologies with high operational and recurring costs might not be useful. The Biosand Filter is a household water filter which was adapted to treat arsenic, iron and biological contamination by S M Sehgal Foundation and renamed as Jalkalp Filter. A Jalkalp reinnovative model of Biosand filter fabricated in stainless steel besides its appearance, the steel filter adds to the strength, reliability, durability, self-sustainability, and portability and is a proven drinking water purification method. It helps in reducing the leading risk of waterborne diseases and death in the developing world through biological and mechanical combination simultaneously.

It is also a zero valent iron (ZVI) technology as the process is so designed that As(III) gets oxidised to As(V), Iron shredding placed in diffuser/reservoir zone produces corrosion (hydrous ferric oxide) and As(V) is adsorbed on HFO. In order to achieve total coliform removal percentage target of 100%, an adaptation in the Jalkalp filter was also introduced where in small pieces of thin copper sheet having total surface area of 6 square centimeters was inserted in drainage zone through the outlet spout. A Jalkalp filter that filters water through layers of sand, it offers increased filtration rate and better portability than conventional models of filters. The filter offers 5 barriers for removal of contaminants, namely Inlet Reservoir Zone - where water is poured, Standing Water Zone - keeps the sand wet and oxygenates the biolayer, Biological Zone - Top 5-10 cm of sand, removes pathogens, suspended particles and other contaminants, Non-



Biological Zone – Contains virtually no living microorganisms due to the lack of nutrients and oxygen, Gravel Zone – Holds the sand in place and protects the outlet tube from clogging, Copper Foil – Final Safe Guard. Thus, Jalkalp Filter is an environment friendly innovation with zero energy consumption, high efficiency and affordability in comparison to conventional treatment technologies. It is successful in addressing the issue of water contamination at household levels and is scalable to address common and widespread occurring water contaminants - thereby promoting community health by reduction of waterborne diseases.

The villagers are happy & satisfied with the adoption of Jalkalp filter.

IWP will continue its endeavour of promoting safe drinking water in other villages too, in 2018.

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