

## Reducing and reusing water: The road to sustainable steelmaking

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The steel industry plays a vital role in the economy by supplying various materials to the manufacturing, construction and transport sectors, but whether it be refining iron ore or recycling scrap, steel production is a resource-intensive process that requires large amounts of water. In addition to being used in cooling operations, water is required throughout the steelmaking process for descaling, dust scrubbing and other processes.

According to various Bangladeshi steelmakers, they are increasingly focusing on treatment strategies that improve water and energy efficiency to ensure long-term sustainability for the industry and the environment.

As such, the steel industry has seen significant change over the years, including fluctuations in growth, a shift towards scrap recycling, greater geographical distribution of production facilities, and increased adoption of water management strategies. This is the case the world-over and Bangladesh is no exception. These changes are interrelated in many ways as the opportunities presented have to be met in a sustainable manner in order to cater to the growing demand for steel in the country.

Therefore, water recycling is important for steel plants as it allows them to recover up to 90 per cent of their potential water usage. Water management strategies help steel plants recover and recycle water, which can result in significant cost savings by reducing the need for access to a water source as well as wastage.

Md Shahidullah, secretary general of the Bangladesh Steel Manufacturers Association, said although a large amount of water is used in steel production, most of it is reused and the industry consumes relatively less water than the dyeing process of garment industries.

Less than just 10 per cent of the water used by steelmakers is consumed during production as most of it evaporates during the cooling process.

"This is due to the use of indirect,

non-contact, cooling for processing equipment," added Shahidullah, also managing director of Metrocem ispat. During the cooling process, high pressure valves are used to spray water on steel products, particularly thermo-mechanically treated bars at continuous casting mills.

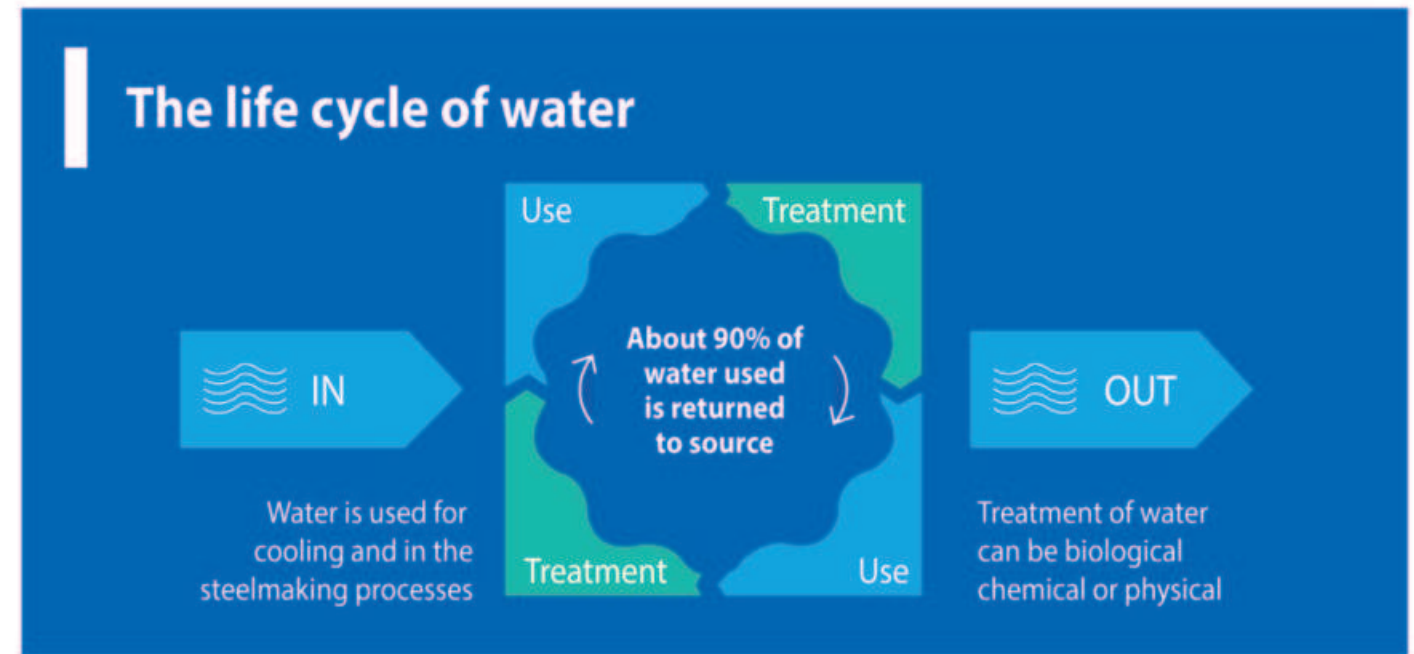
water," he added.

Sengupta went on to say that the amount of water discharged by a plant will vary depending on the type of cooling system used.

He said they extract groundwater from the mill area that can be used and recycled to ensure value addition.

Bangladesh that have a combined capacity to manufacture nine million tonnes a year.

At present, Bangladesh's steel consumption is significantly lower than the global average, according to the World Steel Association, an international trade body for iron and steel industries. The per



Globally, according to the World Steel Association member survey 2011, the average water intake for an integrated plant was 28.6 m<sup>3</sup> per tonne of steel produced, with an average water discharge of 25.3 m<sup>3</sup>. For the electric arc furnace route, the average intake was 28.1 m<sup>3</sup> per tonne of steel, with an average discharge of 26.5 m<sup>3</sup>. This demonstrates that overall water consumption per tonne of steel produced is low, ranging from 3.3 m<sup>3</sup> to 1.6 m<sup>3</sup>.

Tapan Sengupta, deputy managing director at BSRM, said they use natural water at their steel manufacturing plant through a recycling process.

"Without recycling the water it is not possible to use natural water all the time as the process requires huge quantities of

Considering its need for large quantities of water, GPH ispat developed a water harvesting plant on 50 acres land in the adjoining area of its steel plant in Mirsarai, Chattogram.

"We will use this facility for harvesting rainwater that will be used round the year at our steel plant," said a senior official of GPH ispat.

"We will not use groundwater or other natural water bodies for production," he added.

GPH ispat invested in the system in accordance with the guidelines of the Institute of Water Modelling to protect groundwater from contamination and recycle the water used by its industrial units.

There are about 40 active steelmakers in

capita consumption in Bangladesh currently stands at 45 kilograms (kg) while the global average is 208 kg. In India, the average is 65.2 kg, and 42 kg in Pakistan.

Per capita steel consumption is much higher in developed countries with South Korea requiring 400 kg, the US needing 600 kg, and Japan 1,000 kg. As per the production capacity of local steel plants, they need a million gallons of water per day for manufacturing.

Given water's essential value to society, the steel industry should take the responsibility for water management seriously and constantly evaluate how best to use water, finding improvements both in conservation and reuse.

## Water Health: The GPH ispat's Approach of Preservation



GPH's Quantum Electric Arc Furnace with Winlink Technology is a completely green, world class factory

There is not an abundance of drinking water available in the world. Only 3% of the Earth's available water is freshwater, with less than 1% of this being accessible. Therefore, protecting the quality of freshwater is of paramount importance, especially for a country like Bangladesh.

Bangladesh is growing rapidly, and without an adequate supply of safe groundwater, the different strata of society, ranging from residential to industrial, will fail. That is why the responsibility of protecting the quality of water falls on every individual and organization within the country.

This is exactly why GPH ispat has, in accordance to the guidelines of Institute of Water Modelling (IWM), invested in a system to protect ground

water contamination for the industrial units of GPH.

The system comprises of several components, the first being an artificial lake that can reserve up to 1.5 million cubic metres of water. This lake was set up in a barren area, spanning



around 50 acres of land. GPH ispat established an entire ecosystem around the artificial lake, which includes wildlife such as deer, snakes, foxes, fishing cats, hedgehogs, lemurs and

squirrels.

GPH ispat also supported and encouraged the local people to plant trees around this artificial lake. So far, over 2 lac trees have been planted, creating a rich, biodiverse area which consists of a variety of seasonal vegetables and fruits on the hillside next to the lake.

The lake, which has been approved and certified by IWM, is used for two purposes.

Firstly, the lake collects and stores rainwater, which allows GPH ispat to use this rainwater for its factories, ensuring that no groundwater is used from the local area. The Water Treatment Plant enables 2,500 cubic metres of rainwater to be harvested every day. This rainwater harvest is

further increased during the monsoon season, with an additional 1,000 cubic metres being harvested.

Secondly, the lake is used to recycle the wastewater generated by GPH ispat's factories. The recycling process involves the usage of the costly and highly efficient Water Treatment Plant (WTP). This plant removes 100% of the contamination from the wastewater before discharging it into the lake, where it is reused by GPH ispat's factories. There is zero discharge of liquid waste, ensuring that no damage is done to the environment. The industrial wastewater treatment saves around 200 cubic metres of groundwater every day.



The system is so efficient that GPH only uses 75% of the water stored in this lake, distributing the remaining 25% to local inhabitants. Around 50 families living near the production facilities are benefited from this rainwater

- 50-acres of artificial lake used for harvesting rainwater.
- With Zero Discharge Technology 100% of wastewater from factories is recycled.
- No groundwater used by GPH factories.
- 25% of the artificial lake's water provided to the local community.
- 2 lac trees planted around the lake.
- Engaging local community with farming (fish and domestic birds) for financial support and development.
- Enrich the biodiversity without sacrificing the existing flora and fauna.
- Involving directly to the NDC (Nationally Determined Contribution) to its climate action plan to cut emission and adapt to climate impacts.

harvesting project, using the harvested water for day to day use and agricultural work.

While establishing such a water recycling and treatment system required a significant investment, GPH recognized the importance of preserving a valuable resource like groundwater.

GPH hopes that its efforts to preserve groundwater will have a positive impact by raising awareness and knowledge on the topic of



GPH lake certified by IWM to harvest rainwater