

Improvement of labour and environmental standards in Pakistan's textile industry (TextILES)

BUSINESS CASE STUDY ON ENVIRONMENT AND SUSTAINABILITY

KOHINOOR TEXTILE MILLS LIMITED (KTML)

CONTEXT AND BACKGROUND

Kohinoor Textile Mills Limited (or "KTML") was founded in 1953 in Rawalpindi, Pakistan. It is a composite manufacturing company comprising spinning, weaving, processing, and home textiles. In 2021, they have nine units with 158,544 spindles with a total production of yarn of 28,800,000 lbs per annum.



GIZ'S GUIDED SUSTAINABILITY INITIATIVE

The focus of GIZ's support to KTML was on wet processing, i.e., dyeing, printing, and finishing for home textiles. DfS, developed by GIZ and partners, is a top-to-bottom environmental approach for all involved in the organization. Also, Change Management Teams (or "CMTs") in the participating organizations enable participative problem solving. Action plans are developed accordingly. CMT Teams were invited to KTML. The solutions provided included: value added training, implementation of interventions and capacitance of KTML's staff. The DfS based interventions at KTML were targeted at addressing water conservation (including wastewater management), energy efficiency, and chemical management.



GIZ conducted baseline studies at KTML and provided technical and professional advice: (1) They shared relevant tools and technologies available in the industry (for e.g. installation of the DAF unit for recycling of wastewater and investment in solar panels for renewable electricity), and (2) They suggested chemical management practices and capacity building through CMT workshops. GIZ arranged a visit to Arcoma, Pakistan's first zero liquid discharge company, to learn from their experiences.

PRE-DfS CHALLENGES

WATER CONSERVATION CHALLENGES

- KTML is located in a water deficient district and relies on commercially sourced water.
- 300-400 tonnes of water recycled per day at KTML and major portion of wastewater is drained (421 million liters)

ENERGY EFFICIENCY CHALLENGES

- KTML installed 2 megawatts (MW) of solar energy facility, however the team had limited understanding on adopting energy efficiency measures.
- KTML's exclusive reliance on fossil fuels pumps carbon dioxide into the atmosphere.

CHEMICAL MANAGEMENT CHALLENGES

- Issues of misidentification during chemical procurement
- Tracing requirements for each order was an arduous task
- Chemical inventory was stored without understanding of compatibility
- Chemical waste storage was not in line with industry best practices
- Use of PPE by management and labor was limited (15-20%)

OTHER IMPORTANT CHALLENGES

- Backlash faced when KTML tried to install automatic sensor-based taps at the factory mosque
- Ownership and sensitizing KTML team for water and energy conservation
- Investment and budget requirements for sustainability related initiatives

THE OVERALL IMPACT

GENERAL OUTCOMES

- Business benefits were visible in production processes and international buyer appeal.
- Undertook certifications for chemical safety and other sustainable process certifications.
- Focused on supply chain sustainability.
- Worked on Global Recycled Standards.
- Employees' sensitivity towards sustainability greatly improved.
- Installation of automatic sensor taps

WATER CONSERVATION

As of November 2021, the company was recycling 1200 – 1400 tonnes of water per day, nearly three times the water recycled prior to DfS based intervention. The efficiency of the Effluent Treatment Plant was also increased due to the installation of Similarly, Total Suspended Solids (TSS) were reduced from 300 to 30-60 after passing through DAF. The efficiency of ETP was also increased due to the installation of DAF unit. **(Table 1).**

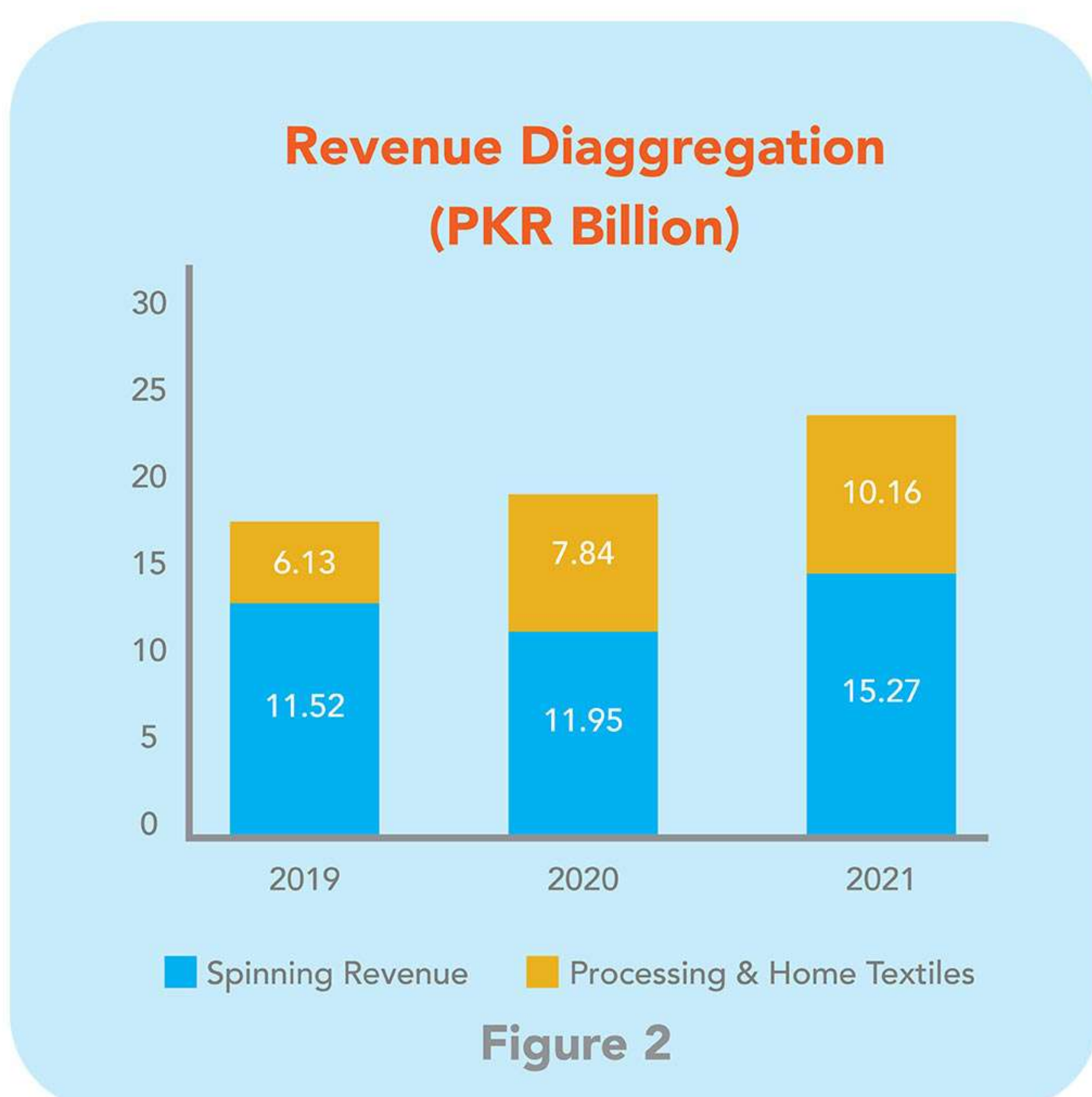
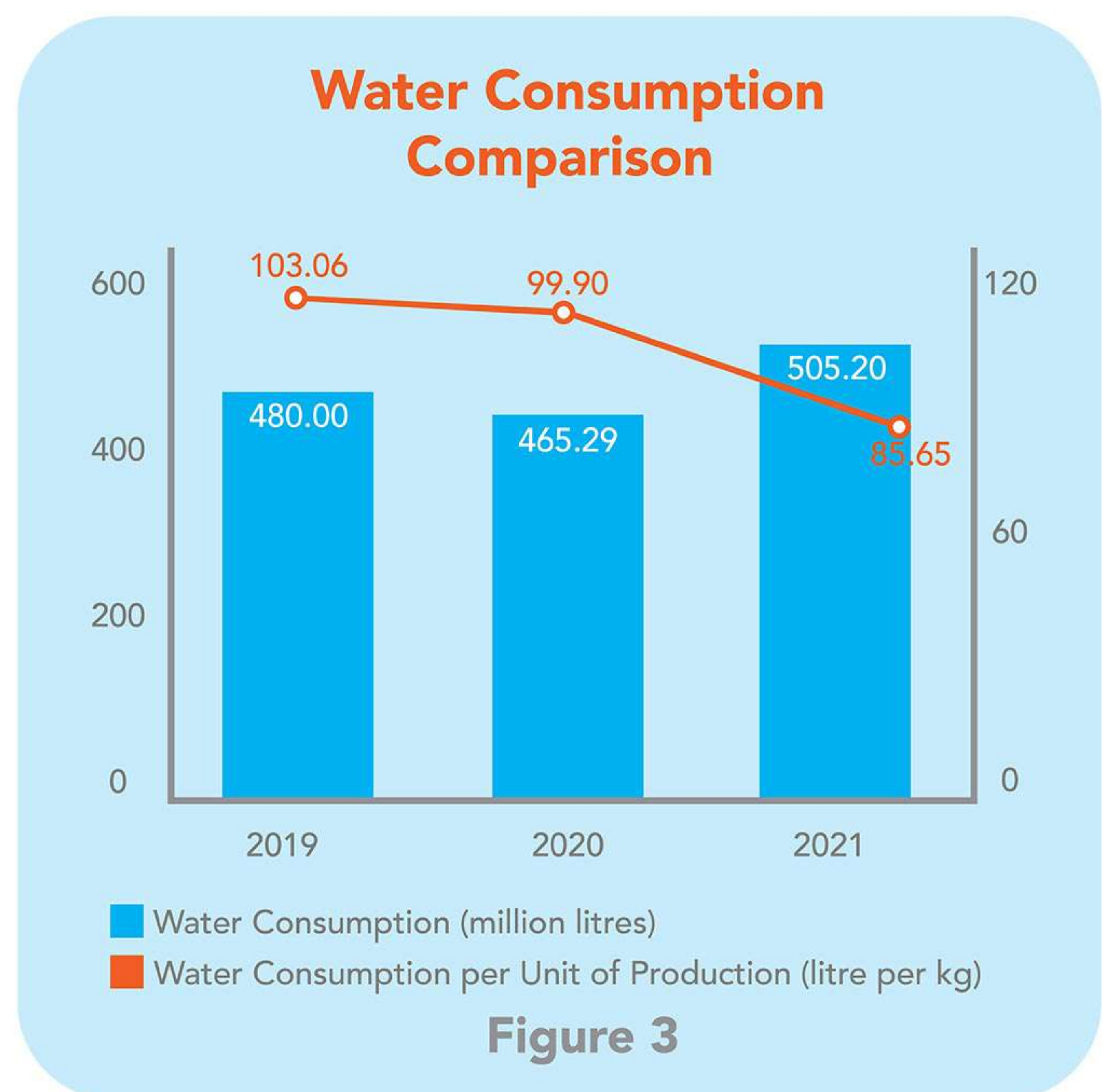
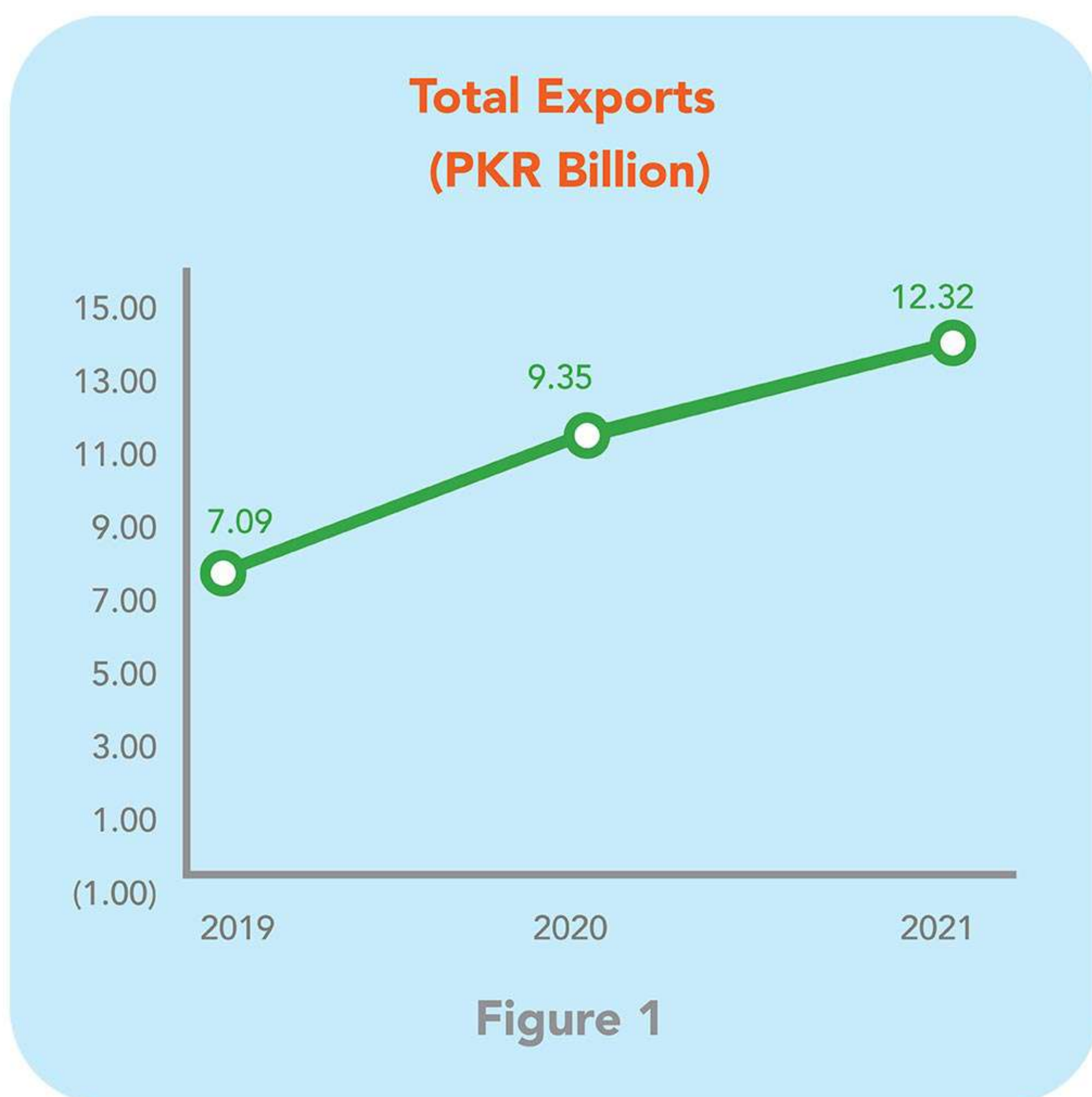


Table 1: Water treatment data

Item	Before DfS Intervention (mg/l)	After DfS Intervention (mg/l)	Percentage Change
Biological Oxygen Demand (BOD)	732	24	97
Chemical Oxygen Demand (COD)	1700-3000	1360-2400	20
Total Suspended Solids (TSS)	300	30-60	80-90

There was 17% reduction in water consumption from 2019 to 2021.

Water consumption was reduced from 103.06 liters per kg of fabric in 2019 to 85.65 liters per kg of fabric in 2021, which is 17% reduction. The Figure shows the water saving in 2020 were -14.71 cubic decameter (or "dam³") (negative sign indicates water wastage) which was increased to 39.92 dam³ in 2021. By November 2021, 75% of wastewater was being recycled and delivered to the processing unit.

Annual Savings From Water



Figure 4

An artificial rainwater reservoir of 6-million-gallons was constructed to reduce reliance on commercially sourced water. Aluminum Sulphate was used to control the pH value and de-coloration of water. These initiatives were environmentally friendly and cost-effective.

Rainwater Consumption (dam³)

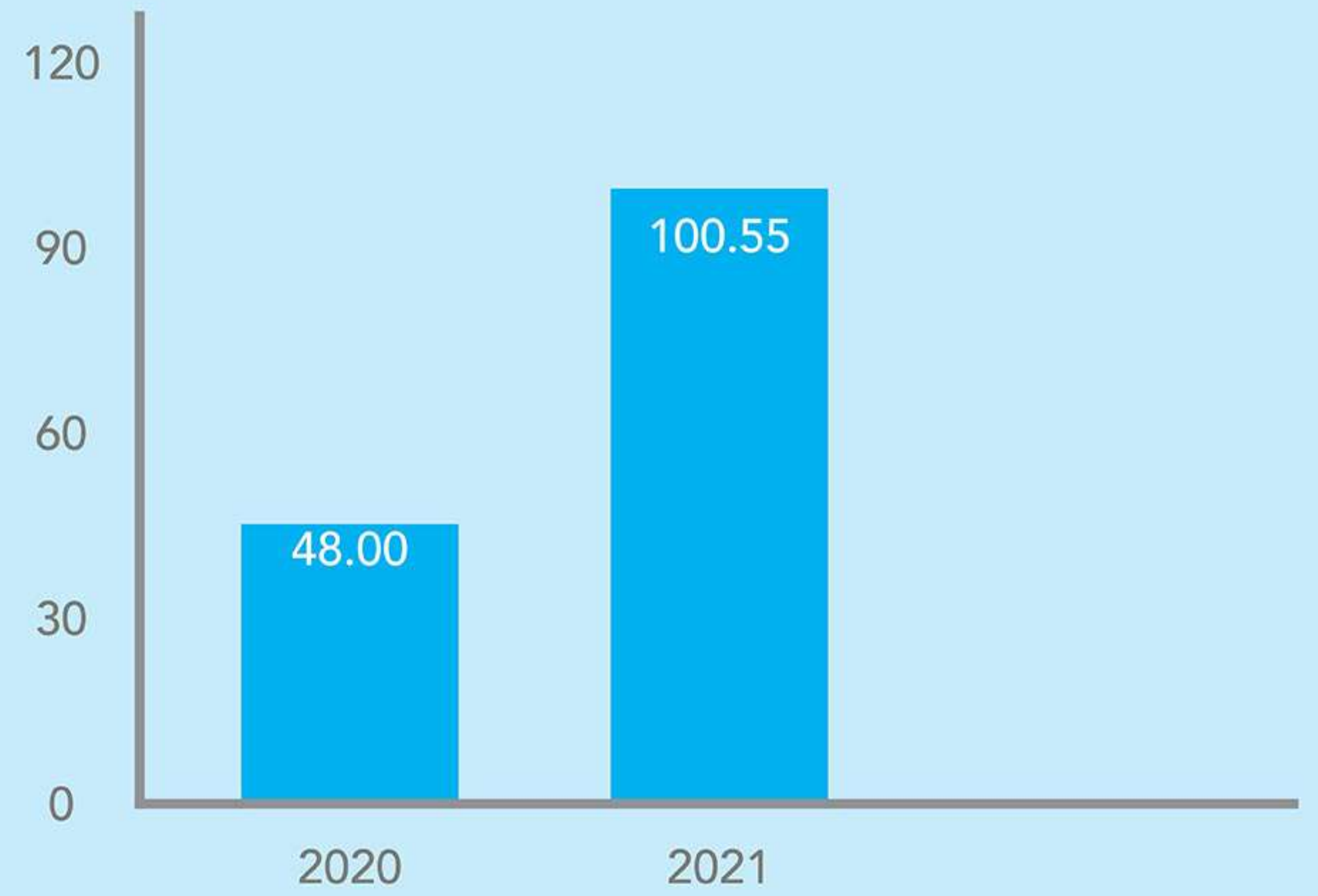


Figure 5

Wastewater Drained (dam³)



Figure 6

ENERGY CONSERVATION

KTML increased solar installed capacity, installed 5MW solar capacity in Rawalpindi and 2 MW of solar energy in Gujjar Khan. 20% of KTML's total electricity load was borne by cleaner energy. KTML has planned to double their solar energy capacity to 10 MW by the end of 2022.

Solar Energy Production vs Energy Conservation

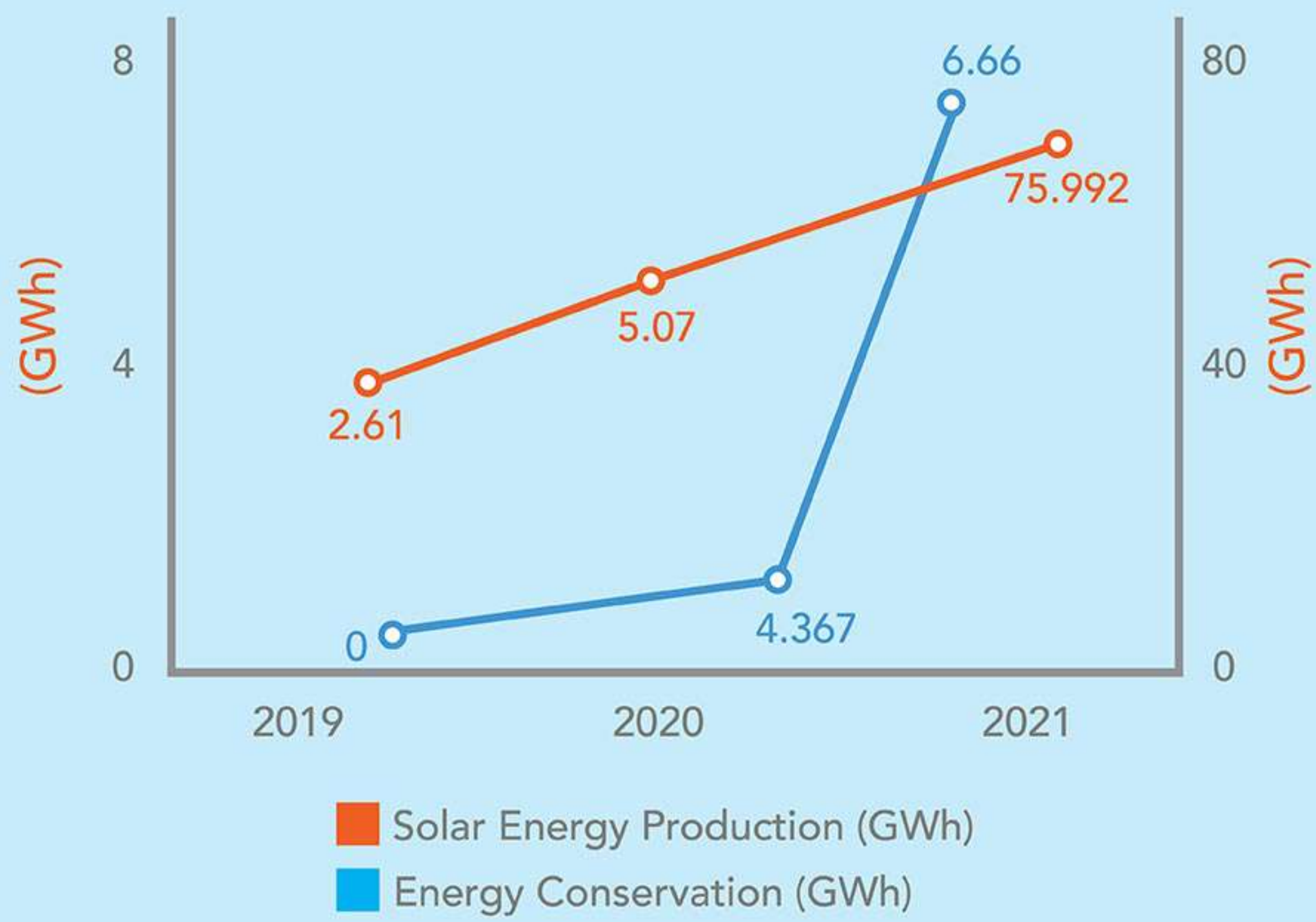


Figure 7

CHEMICAL MANAGEMENT MEASURES

- Standardization of Chemical Inventory Log
- Sensitizing KTML staff chemical management in efficiency, safety, and sustainability.
- Improvement in chemical purchase management system and efficiency in use of chemicals.
- Improvements in chemical storage & GHS labelling of chemicals and use of PPEs.
- Training and capacity development made

Consumption of Chemicals (kg per kg of fabric)



Figure 8

workers aware about proper protective equipment.

- Became compliant with Restricted Substance List (RSL) standards

Chemical Inventory (volume in tonnes)

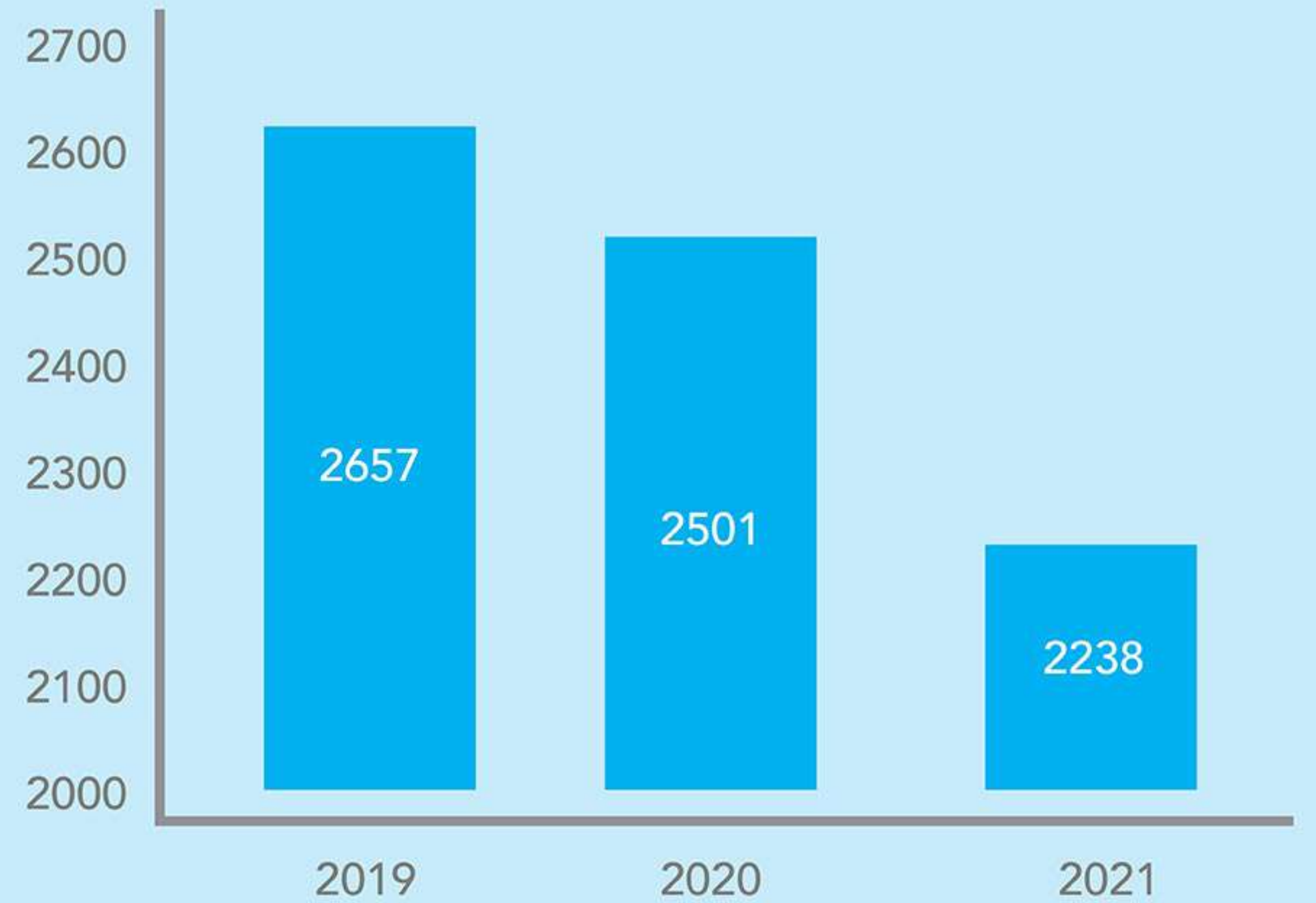


Figure 9

AN EXAMPLE OF INDIVIDUAL SUCCESS

Interestingly, the positive impact of sustainability interventions did not remain confined to the factory or office space. Qureshi thus shared his personal experiences:

I have personally experienced a visibly positive impact of sustainability initiatives in my life. It has clarified my concepts about environmental conservation and our individual and collective responsibilities. Now, it's not only about this office or workplace, but even in my own home, I am conscious and try to be conservation oriented. For example, in food, I have learned to take only as much food in my plate as I could eat. I have also trained my children to fill a glass with water only as much as they could drink instead of wasting or throwing away extra water.

TOP MANAGEMENT'S CONTINUED COMMITMENT TOWARDS SUSTAINABILITY

KTML's owner and CEO encouraged their professional managers to engage in sustainability initiatives. KTML installed solar energy plants due to sustainability consideration, cost-effectiveness, and to shape a positive brand image.

While GIZ's formal intervention ended in 2020, KTML remained committed to environmental responsibility and sustainability. Top management remained committed and regularly reviewed progress to these projects.