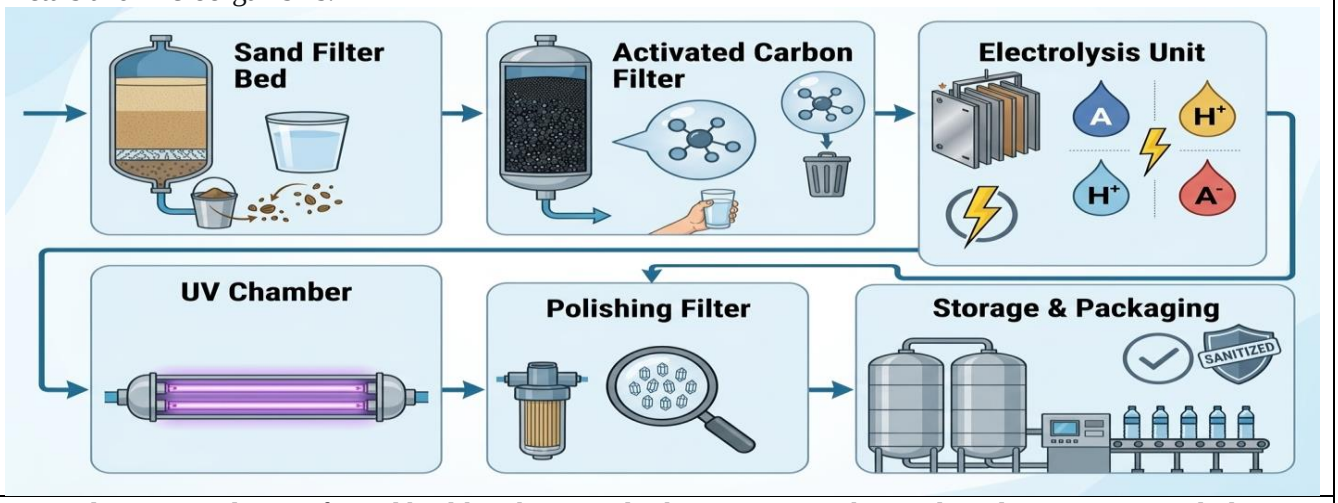
Alkaline water

Field	**Details**
Product Name	Alkaline Water
Brief Description	A cost-effective, scalable process for producing alkaline drinking water through groundwater pre-filtration, activated carbon filtration, electrolysis (9–12V DC), food-grade bicarbonate dosing, UV-C disinfection (254 nm), and final polishing filtration. The product is slightly alkaline, low in TDS (<200 mg/L), free from harmful heavy metals and microorganisms. 
Problem Being Addressed	Limited access to clean, safe, and health-enhancing drinking water in urban and rural regions, particularly areas with unreliable electricity and low-income populations. Addresses water quality challenges including microbial contamination, heavy metals, and lack of mineral enrichment in conventional drinking water sources.
Primary Applications	Daily drinking water for households, health-conscious consumers, bottled/packaged alkaline water distribution, institutional water supply (schools, hospitals, offices), rural and urban water treatment facilities, and emergency/disaster relief water supply.
Target Users & Buyers	Low-to-middle income households, health-focused consumers, bottled water companies, NGOs and government water programs, rural communities with limited clean water access, urban residents seeking premium drinking water, and the food & beverage industry.
Development Status	The process is fully developed and documented, with laboratory-scale production validated, quality control protocols established, a scalable design for urban and rural deployment, readiness for pilot-scale manufacturing and commercialization, and a 7-member inventor team from Bangladesh research institutions.
Testing & Quality Validation	pH: 8.0–8.5 (BSTI Std: 6.5–8.5); TDS: <200 mg/L (BSTI Std: 1000 mg/L); Total Coliform: <1.8 MPN/100ml (BSTI: 0); Fecal Coliform: <1.8 MPN/100ml (BSTI: 0); E. coli: Absent; Salmonella spp.: Absent; Vibrio spp.: Absent;Yeast & Mold: Absent; Total Viable Count: $<1\times10^3$ CFU/ml; Heavy metals (Cr, Fe, Mn, Cu, Zn, As, Cd, Hg, Pb): All below allowable limits. Test methods: APHA standard methods & in-house protocols and UV-C disinfection: 99.99% kill rate for E. coli, Hepatitis A, Giardia, Cryptosporidium.
Core Technical Advantages	Engineered for resource-constrained settings, this cost-effective system uses locally sourced sand and activated carbon in a multi-barrier process (sand filter → carbon → electrolysis → UV-C → polishing) for chemical-free disinfection without taste or byproduct residues. Its 9–12V DC, 1–5A draw enables low-power, minimal-waste operation. Scalable 1–10 GPM flow suits rural and urban use. Durable components UV lamps rated 8,000–12,000 hours, carbon beds lasting 8–12 months plus rigorous pH, microbial, and mineral checks ensure sustainable, affordable, high-quality drinking water.
Raw Materials & Supply Chain	Groundwater (pathogen- and toxin-free) is the base. Food-grade bicarbonate (98–100%, Sigma Aldrich) joins local analytical-grade sand and activated carbon. Quartz-sleeved mercury vapor UV-C lamps (40–100W), platinum-coated titanium electrodes (5–7 plates), an ion-exchange membrane separating acidic/alkaline streams, a turbulent-flow stainless steel reactor, and sanitized food-grade storage complete the system.

Key Machinery	Sand Filter Bed; Activated Carbon Filter Bed; Electrolysis Unit; titanium/platinum electrodes; UV Chamber; Polishing Filter; Storage/Packaging; Quality Control Lab.
Indicative Economics	Raw materials stay low local groundwater, sand, carbon, bicarbonate. Energy is minimal: 9–12V DC electrolysis plus a 40–100W UV lamp. A validated 5L batch scales to 11,660L per 30-minute 10W UV-C treatment. UV lamps last 8,000–12,000 hours; carbon beds 8–12 months/4,000 gallons. Affordable for low-income users, it competes with commercial alkaline brands at lower cost, offering high ROI through low operations and a growing health-water market.
Market Evidence & Readiness	Standardized formulation protocol developed at BCSIR is ready for commercial technology transfer, industrial scale-up, and license agreements.
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