The increased agriculture coverage scenario shows a 39% rise, peaking at 248 × 10^6 m³ aligned with planting and harvesting periods. Among all scenarios, the extended dry period and high population growth show the highest increases in both volume and percentage. The extended wet season records the lowest demand and variability, while the extended dry period scenario shows moderate growth linked.

4.3.4 Domestic and institutional water demand relative to reference Scenario

Projected domestic water demand for high-potential and low-potential areas (Figure 8). Under the reference scenario, demand remains below 32 × 10^6 m³ by the year 2052.

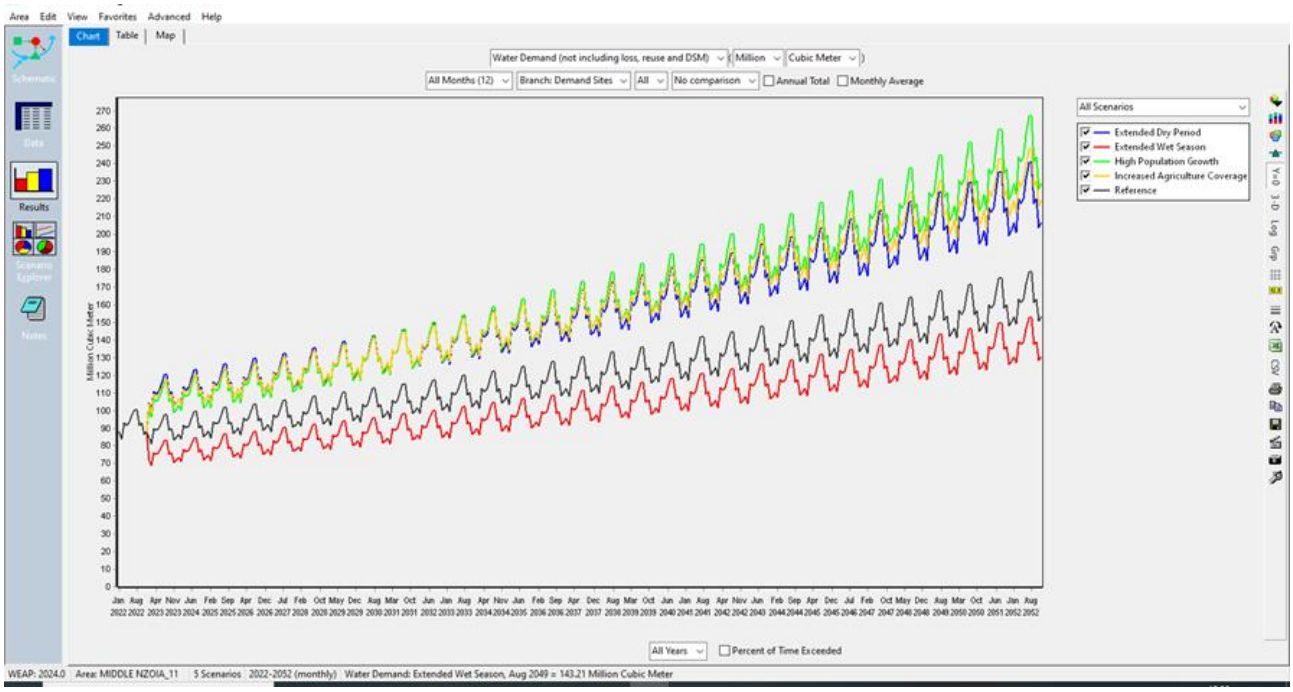

Figure 8 Domestic water demand in high-potential areas relative to the reference (Source: Researcher (2025))

The above image shows a WEAP system interface with a chart output displaying water demand projections under different scenariosY-axis: Water demand (Million Cubic Meters). X-axis: Time (Years from 2022 to 2052, with monthly resolution). The saw-tooth pattern reflects seasonal variation in water demand (wet vs. dry months), Extended dry period (green): Produces the highest water demand, steadily increasing over time, peaking to 30 × 10^6 m³ by the year 2052. Seasonal spikes are the largest, Extended wet season (blue): Lower than dry period but still significantly higher than baseline, showing the effect of more water use during longer wet conditions, high population growth (yellow): Moderate but steadily increasing demand, reflecting population-driven domestic demand pressures, increased agriculture coverage (red): Shows a small but steady increase in demand compared to the reference, reference (black/near zero line): The baseline case, serving as a comparison point.

Climate factors (dry/wet periods) create the largest deviations in demand compared to population or agriculture changes, extended dry periods strain water demand most severely, likely due to irrigation and domestic supply needs, population growth has a significant long- term impact but less seasonal fluctuation, agricultural expansion adds demand but is relatively smaller in this analysis compared to climate-driven factors (Figure 9).

Reference (black line) - The baseline scenario, extended dry period (red) - Shows decreased demand relative to reference, extended wet season (yellow) – Near-zero difference, suggesting minimal impact, high population growth (green) - Significantly increases demand over time, increased agriculture coverage (blue) - Also shows rising demand, though less than high population growth.