Practical Example: How Much Rainwater Can Be Collected on 1 Hectare?

Basic data:
• Average annual rainfall: 500 mm = 0.5 m
• Area: 1 hectare = 10,000 m²

Basic calculation:
Volume = rainfall × area
0.5 m × 10,000 m² = **5,000 m³**, equivalent to **5,000,000 liters** of rainfall per year.

Runoff coefficient

Surface	Average coefficient
Smooth roofs	0.9
Paved surfaces	0.6 – 0.8 (≈0.7)
Bare soil / fields	0.15 – 0.4 (≈0.2)

Scenario A – Fully efficient surface (e.g. roof)
5,000 m³ × 0.9 = **4,500 m³ = 4,500,000 L** collected per year.

Scenario B – Mixed surfaces (realistic case)
• Roofs (1,000 m²): 0.5 × 1,000 = 500 m³ × 0.9 = 450 m³
• Paved areas (2,000 m²): 0.5 × 2,000 = 1,000 m³ × 0.7 = 700 m³
• Soil (7,000 m²): 0.5 × 7,000 = 3,500 m³ × 0.2 = 700 m³

Total collected = 1,850 m³ = 1,850,000 L
Equivalent to about **185 mm/year of usable water** distributed over 1 hectare.

Practical guidelines:

• **Tank sizing:** Capacity (m³) = (desired mm × area ha) / 10 × (1 / efficiency). Example: to ensure 100 mm on 1 ha → approximately **1,000 m³** of water.
• **First flush system:** install a device to divert the first, dirtiest rainfall.
• **Accurate estimation:** measure real catchment surfaces and apply appropriate coefficients.
• **Safety margin:** consider 10–20% losses due to evaporation and inefficiencies.
• **Priority use:** drip irrigation, washing, and non-potable uses; extra treatment only for livestock or sensitive uses.

Situation	Collected volume (m³/year)	Liters/year	Equivalent (mm/ha)
Total rainfall	5,000	5,000,000	500

Roofs (theoretical)	4,500	4,500,000	450
Mixed surfaces	1,850	1,850,000	185

With an average annual rainfall of 500 mm, a 1-hectare farm can **collect between 1,800 and 4,500 m³ of water**, depending on the available surfaces and their efficiency. A strategic, economical and sustainable resource that strengthens the farm’s production resilience.