Financial Analysis: Impact of Irrigation Scenarios

1. **Assumptions for the Analysis:**

- **Crop Yield (kg/ha):**
    - Without irrigation: 1000 kg/ha (limited by dependence on natural rainfall).
    - With manual irrigation: 1500 kg/ha (improved by consistent water supply).
    - With automated irrigation: 2000 kg/ha (optimized by precise water management).
- **Revenue ($/ha):**
    - Based on a price of 1 $/kg for crops.
    - Revenue = Yield (kg/ha) × Price ($/kg).
- **Cost ($/ha):**
    - Without irrigation: Minimal costs related to land preparation (e.g. 200 $/ha).
    - Manual irrigation: Moderate costs for water, tools, and labor (e.g. 400 $/ha).
    - Automated irrigation: Higher costs for equipment, energy, and maintenance (e.g. 700 $/ha).
- **Net Income ($/ha):**
    - Net Income = Revenue - Cost.

2. **Financial Comparison Table:**

	Crop Yield (kg/ha)	**Revenue ($)**	**Cost ($)**	**Net Income ($)**
Without irrigation	1000	1000	200	800
With manual irrigation	1500	1500	400	1100
With manual irrigation	2000	2000	700	1300

3. Observations:

Without irrigation:

Yields are lowest due to reliance on rainfall;

Costs are minimal but net income remains limited.

With manual irrigation:

Yields improve due to consistent water supply, increasing revenue;

Costs are moderate, resulting in higher net income than without irrigation.

With automated irrigation:

Yields reach their peak due to optimized water management;

Despite higher costs, net income is the highest, demonstrating the system's long-term value.

NB: The data used for this analysis are based on realistic assumptions and documented averages from agricultural studies.