Harnessing AI Safely: Addressing the Challenges of Autonomous Systems

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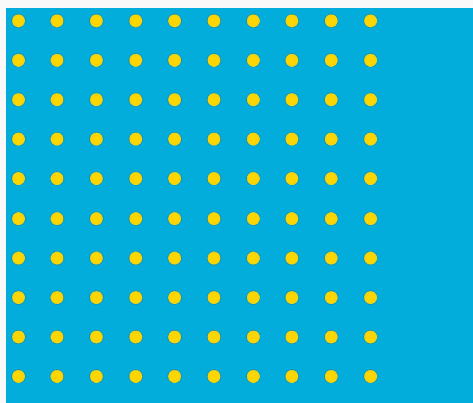
AI Potter

Visual: A split image (dried farmland vs. AI-optimized green fields)

Autonomous Irrigation 2.0:
Explainable AI for Confident Farming in Water-Stressed Europe

Latha, Sarah, Himanshu, Juyeon

1 The Urgent Problem: Water crisis & AI gaps in Farming

Water crisis & AI gaps in Farming

Water scarcity in Southern Europe (Spain, France, Italy)

Existing AI irrigation benefits in vineyards vs. gaps in other crops

Farmers lack AI-driven, explainable irrigation models tailored to different crops

2 **The Risk of Unchecked AI in Farming**

The Risk of Unchecked AI in Farming

AI models trained on vineyards don't generalize well to all crops

Over-reliance on black-box AI can misallocate water, harming yields

Farmers need transparent AI they can trust and adjust

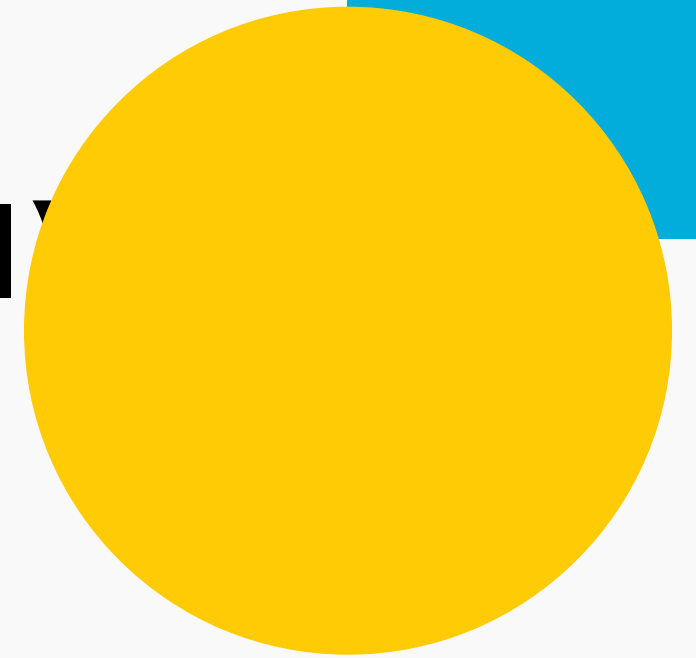**3** **Why This Matters Now (Compelling Reason for Explainable AI)**
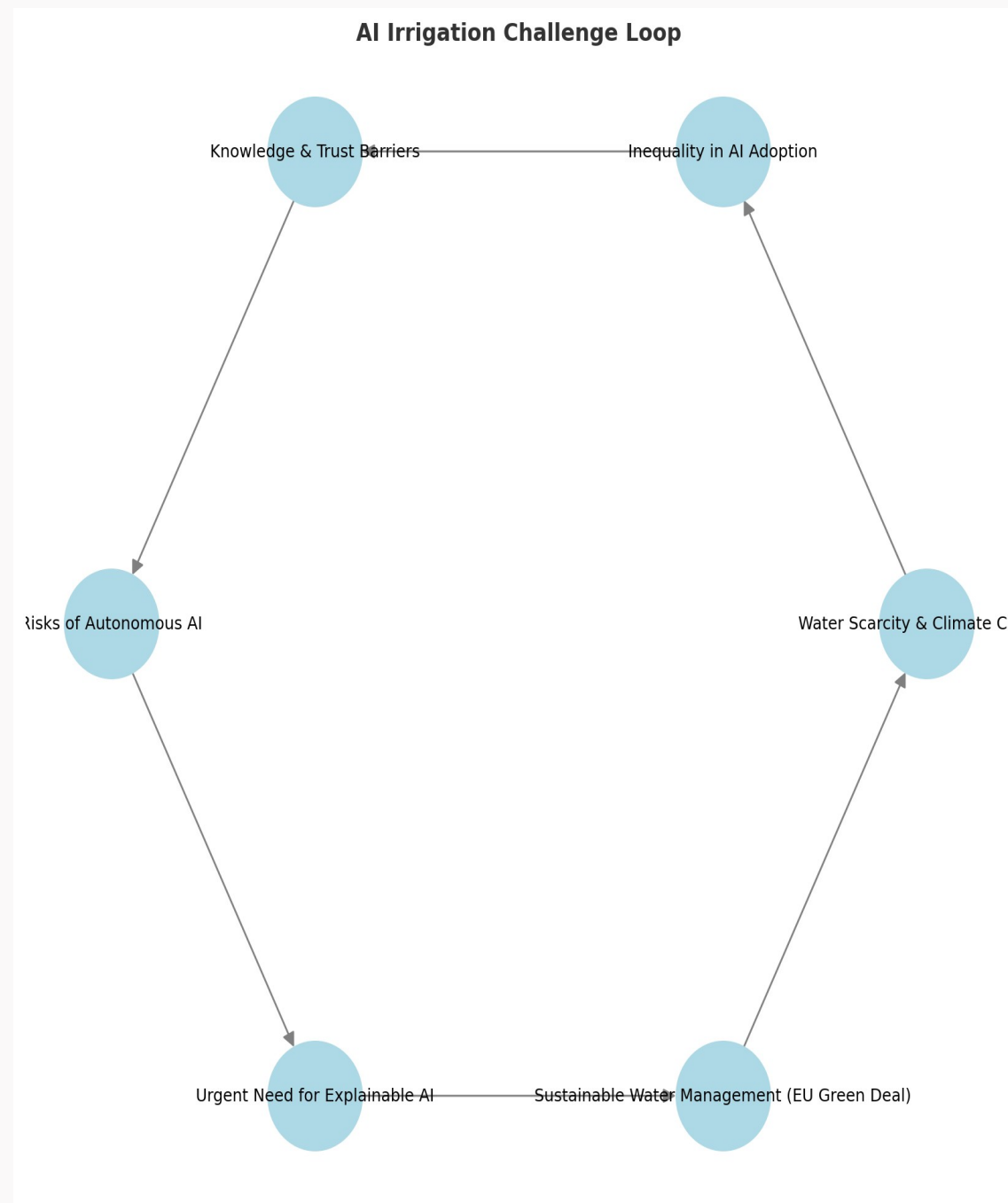
Why This Matters Now (Compelling Reason for Explainable AI)

Regulatory push: EU Green Deal & sustainable farming goals

Economic impact: Droughts already reducing crop yields & exports

Farmer adoption: AI must be explainable, autonomous, and adaptive

AI Irrigation Challenge Loop

- Knowledge & Trust Barriers
- Inequality in AI Adoption
- Risks of Autonomous AI
- Water Scarcity & Climate Change
- Urgent Need for Explainable AI
- Sustainable Water Management (EU Green Deal)

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4 **Solution:
Autonomous Irrigation 2.0**

Solution: Autonomous Irrigation 2.0

AI-driven irrigation tailored per crop, per farm, per region

Transparency-first approach: Farmers can see & adjust AI decisions

Autonomous, but explainable: No hidden black-box decisions

5 **Demo:
Autonomous Irrigation 2.0**

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Demo

R

Green Acres Farm • Corn • Vegetative Stage

CURRENT SOIL MOISTURE
35% / 40% threshold

CROP STATUS
Healthy

NEXT IRRIGATION
Auto

💧 AI Irrigation Decision
Today, 12:12 PM

🌧 Watering at **50%**

Soil moisture is below threshold (35% vs 40%) and no rain expected in the next 24 hours. Corn in Vegetative stage requires consistent watering.

Decision Factors   Show All

💧 Soil Moisture   high impact
   Current reading from sensors is below the optimal threshold of 40%   35%

☁ Weather Forecast

💧 Precipitation Expected
10% chance of rain at 00:12 • 22°C

Today's Forecast

12:12	15:12	18:12	21:12	00:12
☀	☀	☀	☁	☁
27°C	29°C	30°C	25°C	22°C
				10%

6　**Closing: Why We Must Act Now**

Closing: Why We Must Act Now

AI in vineyards shows potential, but other crops are left behind

Explainable AI ensures trust, adoption, and real impact

Call to action: Building AI that empowers, not replaces, farmers

Questions