

AI-POWERED GARDENING HUB

Integrating Generative AI
for Sustainable Gardening



INTRO

This project started from my personal interest in sustainable living, but it's grown into something much broader. The AI-Powered Gardening Hub uses generative AI to help individuals, communities, and educators grow food efficiently in any environment. It aims to connect small-scale care with large-scale change—bridging technology, ecology, and human creativity.

“Technology should grow with us, not over us.”



WHAT AM I BUILDING?

The AI-Powered Gardening Hub is an interactive web and mobile system that analyzes real-time environmental data—soil health, sunlight, temperature, and air quality—to provide customized guidance for gardening and crop maintenance. While it's accessible for home gardeners, the same framework could scale to urban gardens, greenhouses, or educational programs worldwide. Kristin Brotherton's "fail-forward" philosophy inspired me to approach design like a collaboration between human curiosity and machine learning—testing, adapting, and growing along the way.



WHY IT MATTERS



Problem: People everywhere face unstable climates, resource shortages, and knowledge gaps in sustainable agriculture.

Opportunity: An intelligent, adaptable hub can help users understand and respond to their unique biome—whether desert, forest, city, or tundra.



On a local level, it supports individuals in producing food responsibly. On a global level, it contributes to data-driven insight on soil conditions, crop health, and resource use.

Natalie Bond's lesson on preserving knowledge reminded me that this hub can act as a digital memory of environmental care, helping communities learn from one another across ecosystems.

FORM & EXPERIENCE

Form: Interactive app and dashboard

Users can:

- View garden stats in real time
- Receive adaptive tips and reminders
- Log growth progress and share results

Each personal garden becomes a micro-model of environmental data that can inform sustainable practices anywhere in the world.



Experience: Combines live data visualization with conversational AI guidance



TOOLS AND TECHNOLOGIES



Frontend: HTML / CSS / JavaScript



AI: ChatGPT API or Gemini for generative feedback



Inputs: IoT soil sensors, weather APIs, air quality data



Design Tools: Figma, Illustrator, Canva for visual design



Hardware: Arduino or Raspberry Pi for affordable integration

These technologies make the hub scalable, low-cost, and adaptable across regions—so sustainability isn't limited by location or budget.



★ USER EXPERIENCE & VISUAL STYLE

Clean, organic interface using natural greens, tans, and light neutrals.

- Dashboard displays metrics and visual trends
- Chatbot gives voice or text guidance
- Optional community-sharing tab to compare environmental conditions globally

Bond's focus on empathy guided my design – each interaction should feel supportive, not robotic.



ETHICAL & CREATIVE FRAMEWORK

- Brotherton: Showed that creativity thrives when we let AI assist rather than dictate.
- Bond: Emphasized the value of preserving and sharing human knowledge.
- This project merges those ideas—treating AI as a co-creator while protecting user privacy and respecting environmental ethics.
- It builds an open, transparent model for sustainable technology—one that prioritizes both innovation and accountability.



NEXT STEPS



1. Build an interactive prototype in Figma or React.
2. Test with sample data from different biomes (e.g., dry, coastal, urban).
3. Add simulated AI dialogue for feedback and learning.
4. Explore partnerships with local gardening programs or environmental nonprofits.

Challenges: ensuring reliable data inputs, cross-regional accuracy, and maintaining ethical design principles.

Goal: prove that generative AI can empower people and protect the planet—starting small, scaling big.

vision and impact

"EVERY GARDEN HAS GLOBAL ROOTS."

The AI-Powered Gardening Hub began with personal passion, but its reach extends far beyond one garden. It demonstrates how small, localized innovation can contribute to global resilience.

By connecting data, creativity, and human insight, this project supports sustainable food production and climate adaptation—regardless of biome.

From backyards to community farms, every user becomes part of a shared effort to restore balance between people, technology, and the earth.



THANK YOU

Illustration credits:

- set: nAFvl_qMS68 on Canva
- Created by Joyce Caleze on Sketchify



WANT TO CONNECT?

- MS191597@UMCONNECT.UMT.EDU

