

EcoBuddy: AI Climate & Sustainability Action Assistant



1. AI Service Description

Service Definition

EcoBuddy is an AI-powered sustainability assistant designed to help youth and communities transform climate awareness into meaningful environmental action. It uses a **Learn → Act → Reflect** prompt-flow architecture supported by GPT-4/4o to deliver personalized eco-missions, simple explanations of climate concepts, and daily reflective conversations.

EcoBuddy's core features include:

- Personalized daily eco-challenges
- Clear explanations of complex environmental topics
- Real-time impact tracking (CO₂, water, waste reduction)
- Gamified motivation through points, badges, and leaderboards
- Reflection prompts that drive long-term habit formation

Problem It Solves

Youth care about climate change but don't know how to act

Many want to help but lack actionable, meaningful guidance.

Climate information is overwhelming

Scientific reports and environmental data are complex, discouraging beginners.

Eco-habits are difficult to build and sustain

Without support or feedback, motivation drops quickly.

Users cannot see how small actions lead to global impact

Personal efforts often feel disconnected from SDGs and global climate goals.

User Value

- Highly personalized eco-missions tailored to location, lifestyle, and age
- Simple explanations of key climate concepts
- Measurable impact tracking with CO₂, water, and waste metrics
- Daily conversations that reinforce environmental thinking
- Gamified rewards to maintain motivation

2. Motivation



Climate change, biodiversity loss, pollution, and resource overconsumption are among the most urgent challenges humanity faces. Millions of young people want to take action but lack structured tools, simple explanations, or personalized guidance.

EcoBuddy was created to:

- Make climate science understandable for all ages
- Turn environmental awareness into daily eco-behavior
- Provide a support system that motivates users to sustain habits
- Connect individual actions to global sustainability goals (SDG 13, SDG 14, SDG 15)
- Empower youth to become eco-conscious changemakers

The system transforms learning into action and action into measurable global impact.

3. Chat History

User: Hi EcoBuddy, I want to do something good for the environment today.

EcoBuddy: Great! Let's start small. Want to focus on saving water, reducing plastic, or lowering CO₂?

User: Maybe CO₂ reduction.

EcoBuddy: Perfect! What's your usual way of going to school—bus, scooter, MRT, or car?

User: I usually take the bus.

EcoBuddy: Buses are low-carbon. Try walking 10 minutes of your commute today?

User: Sure, I can get off earlier and walk.

EcoBuddy: That's a great habit! Estimated CO₂ reduced today: **0.12 kg**.

User: Nice! Can you teach me something about climate change?

EcoBuddy: Climate fact: Oceans absorb 90% of global warming's excess heat.

User: That sounds scary...

EcoBuddy: It can be, but your actions matter. Walking today helped reduce heat-trapping emissions.

User: What should I do tomorrow?

EcoBuddy: Tomorrow's mission: choose a plastic-free drink option.

User: Okay! Remind me tomorrow.

EcoBuddy: You got it! I'll also help track your weekly CO₂ savings.

4. Iterative Prompt Development Process

Idea

Design a conversational climate-action companion that:

- Breaks down climate concepts into simple explanations
- Assigns personalized eco-missions based on lifestyle and region
- Tracks daily environmental impact
- Maintains user engagement through reflection and gamification

Prompt (Initial Version)

"You are EcoBuddy. Teach the user a simple climate fact. Then give a personalized eco-challenge for today. Finally ask a reflective question about their eco-action."

Experimental Result

- The system generated appropriate daily eco-missions
- Reflection questions increased user engagement and habit-building
- Environmental explanations remained accurate when paired with updated datasets
- Gamification significantly boosted user motivation

Error Analysis

Issue	Observation	Root Cause	Fix
Outdated climate information	Facts were occasionally old	Static data sources	Integrated live APIs for CO ₂ , forests, air pollution
Repetitive suggestions	Users got "eco-fatigue"	Narrow prompt variety	Added seasonal missions + multi-path prompt logic
Irrelevant local advice	Some regions lack recycling systems	Limited localization	Added country/city-aware model inputs
Weak connection to SDGs	Users didn't see global impact	Abstract explanations	Added "Global Impact Mode"

5. Limitations

Requires accurate and frequently updated environmental data

Must balance education with simplicity to avoid overwhelming users

Motivation may drop without varied missions

Impact tracking depends on user honesty and consistency

6. Future Development



Carbon Footprint Calculator
with step-by-step guided math



Deforestation Watch
using rainforest monitoring APIs



EcoQuiz Fridays
for gamified environmental learning



Water Saver Coach
for personalized water reduction tips



Green Pledge Tracker
for goal-setting



Global Impact Mode
showing SDG alignment for every action

7. Conclusion

EcoBuddy transforms environmental awareness into daily, achievable climate action. Through AI-driven explanations, personalized missions, gamified motivation, and measurable impact tracking, it empowers youth, schools, and communities to build lasting environmental habits.

EcoBuddy is more than a chatbot—it is a climate companion that helps build a sustainable future, one action at a time.



8. References

1	Global Forest Watch API
2	UN SDG 13: Climate Action
3	Open environmental datasets (CO ₂ , pollution, deforestation)