1 PROBLEM STATEMENT

- SALTWATER SEEPAGE
- WATER POLLUTION
- SEWAGE EFFLUENTS

2 EXISTING SOLUTIONS LITERAURE REVIEW

- Phytoremediation
- Biobarriers
- Permeable Reactive Barriers (PRBs)
- pH Stabilization
- Nanoparticle Remedy
- Electrokinetic Remediation
- Bentonite Curtains
- Filter Trenches
- Mycoremediation

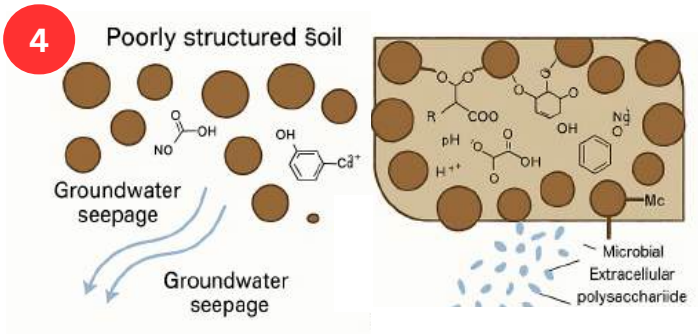
3 Unique approach

BETTER SOIL

PREVENTS SEEPAGE

1. *Biomimicry Research of indegenious roots + PLANTS*
2. *Chemical Extraction and Synthesis*
3. *Validation through extensive Lab Tests*
4. *Prototype through a 3d printed root*
5. *Community App With DIY kit + EDEN beads Prep*

4



MIXTURE	MAIN USE	WHEN TO USE
Citrus Peel + Aloe vera	Soil aggregation	*Hard water / Low micronutrients*
Tamarind Pulp + Green tea (Catechins)	Redox balance	*Iron in water*
Spinach Leaf + Banana peel powder (K^+)	Microbial boost	*Chlorine smell / Low soil activity*
Banana Peel Powder + Charcoal ash (K_2CO_3)	Ionic exchange	*High pH / Poor nutrient uptake*

5 HYPOTHESIS

Synthesis of Bioactive Chelating ligands and Organic Acids from Household Biomaterials for Soil Aggregation, pH Buffering, and Groundwater Seepage Remediation

AVOGADRO

LOW ENERGY GEOMETRY → *MOLECULE IS STABLE.*

NO SPONTANEOUS REACTION → *SAFE TO STORE AND APPLY.*

PROXIMITY WITHOUT BONDING → *VALIDATES OUR FORMULATION LOGIC*

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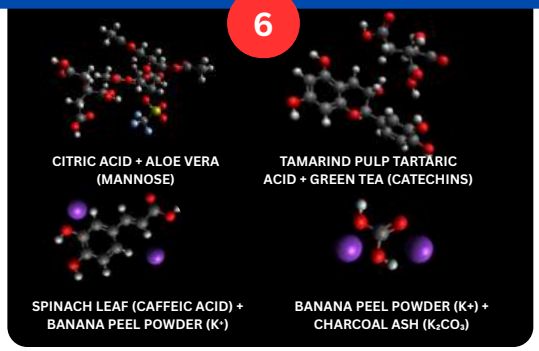
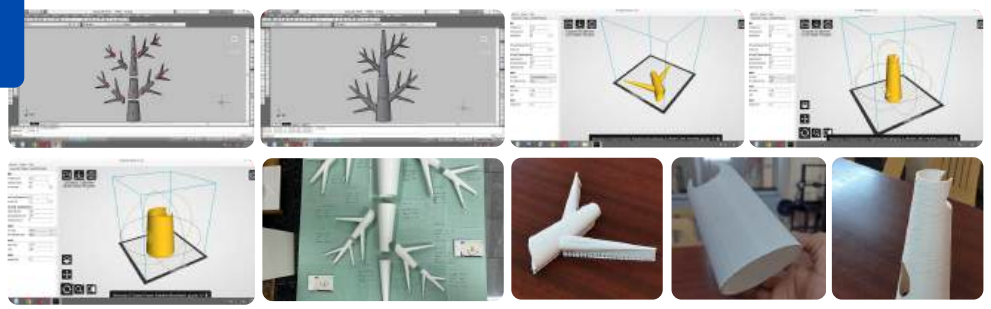
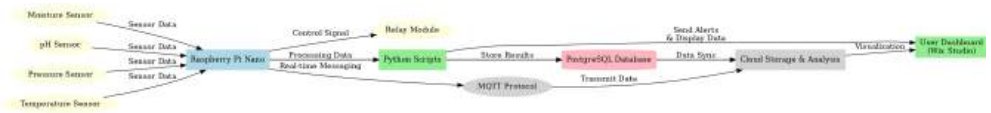


BIOMIMETIC ROOT STRUCTURE DESIGN USING AUTOCAD

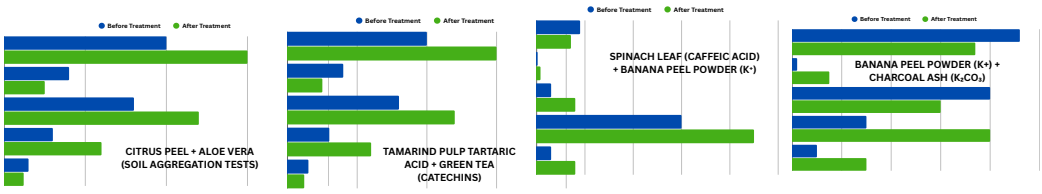




FORMULATION AND TESTING

7

- SOIL PERCOLATION TIME
- JAR SEDIMENTATION TEST
- DROP TEST (CRUMB STRENGTH)
- WATER HOLDING CAPACITY
- SOIL BULK DENSITY CHANGE
- IRON PRECIPITATION TEST
- REDOX INDICATOR TEST
- PH STABILITY IN IRON-RICH SOIL
- COLORIMETRIC FE^{2+}/FE^{3+} TEST
- SMELL TEST



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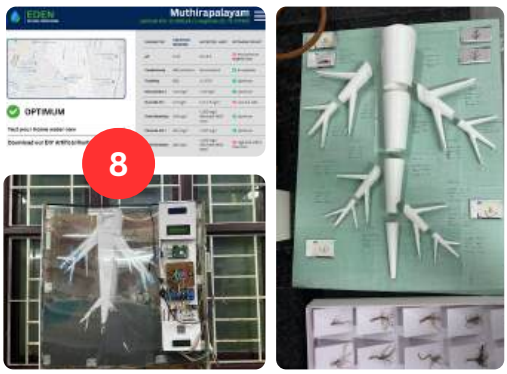

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FROM 3D PRINTED PROTOTYPE

PAPER & KITCHEN BASED DIY KIT

EDEN
ACT LOCAL - IMPACT GLOBAL

1. SYSTEMATIC GREEN CHEMISTRY RESEARCH
2. SCALABLE SOLUTION PONDICHERRY SEEPAGE PROBLEM
3. COMMUNITY-LED SOIL RESTORATION

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EXOGENIC DILATANCY AND EARTH FORTIFICATION NEXUS

KRISHANTH & JAI

EDEN