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Waste-to-wealth: Using household waste in DIY (Do it yourself) landscaping

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Abstract
The increasing global waste problem calls for innovative solutions such as the "Waste-to-Wealth" concept, which transforms household waste into valuable resources. This study explores the application of DIY (Do It Yourself) landscaping techniques using household waste to enhance the aesthetic and functional appeal of display and notice boards at the COCS campus in Hisar, Haryana. A sample of 30 teaching and non-teaching staff participated, providing diverse perspectives. The research involved designing, implementing, and evaluating landscaping and display board enhancements using recycled materials like plastic containers, glass bottles, and organic compost.Quantitative analysis revealed significant improvements post-DIY enhancement. For display boards, mean scores for visual appeal increased by +0.80 (t=9.22), organization by +0.90 (t=9.65), and use of eco-friendly materials by +1.03 (t=10.42). Notice boards showed similar positive changes, with easy notice management improving by +1.10 (t=10.51) and overall sustainability features improving by +0.93 (t=8.62). Survey results indicated increased user satisfaction, enhanced creativity, and stronger motivation to maintain the boards, supporting environmental sustainability principles. The findings demonstrate that DIY landscaping using household waste not only beautifies campus spaces but also fosters environmental awareness and cost-effective resource utilization. This study underscores the potential of Waste-to-Wealth initiatives in promoting sustainable practices and community engagement through creative reuse of everyday waste materials.

Keywords: Waste-to-wealth, DIY (do it yourself), landscaping, household waste, sustainable

Introduction
The concept of "Waste-to-Wealth" has emerged as a revolutionary approach to managing household waste. This concept revolves around transforming what is typically regarded as waste into valuable, functional, or aesthetically pleasing resources. It is a proactive response to the mounting global waste crisis and aligns with the principles of recycling, reusing, and reducing, which are critical in today's world (Mondal and Singh 2024) [7]. One of the most innovative applications of the Waste-to-Wealth concept is in DIY (Do it yourself) landscaping. Rather than discarding kitchen scraps, broken furniture, old containers, or garden waste, these items can be creatively repurposed to enhance outdoor spaces. For instance, kitchen scraps can be composted to create nutrient-rich soil for plants, while discarded glass bottles can be used as garden borders or decorative elements (Chen and Li 2022) [2]. Even old tires can be painted and transformed into colorful planters, and wooden pallets can be converted into garden furniture.

DIY landscaping using household waste is not just an exercise in creativity; it is also an environmentally responsible practice. It encourages individuals to view waste as a resource, fostering a mindset of sustainability. Moreover, it reduces the demand for commercially produced landscaping materials, many of which have significant impact of resource extraction, manufacturing, and transportation (Roy 2019) [9].

Furthermore, engaging in Waste-to-Wealth DIY (Do it yourself) landscaping can be a fulfilling and educational experience. It provides an opportunity for families to work together, fostering environmental awareness among children while allowing adults to explore their creative skills. It also contributes to a sense of pride and satisfaction, as individuals can take credit for transforming waste into something useful and beautiful.

Objectives

- To explore DIY (Do it yourself) landscaping techniques for enhancing the RMCS department using household waste
- To identify creative ways to reuse materials in landscaping

A brief review of literature

- Dhar *et al*., (2021) [4] highlights that waste management as a crucial process addressing solid, organic, and hazardous waste from diverse sectors like urban, electrical, medical, agricultural, and industrial sources. It introduces Agringenium, an innovative solution converting agricultural residues into biodegradable packaging, tackling plastic pollution and promoting sustainability. Despite various government policies aimed at supporting farmers and waste management, implementation gaps remain a challenge. The study emphasizes the importance of enhancing waste management efficiency by controlling waste generation and maximizing recycling rates. This approach supports transforming waste into valuable products, promoting economic and social development through innovative technological initiatives.
- Balaganesh *et al*., (2023) [1] revealed that India's agro-industrial economy generates vast amounts of waste, demanding efficient and sustainable utilization. Techniques like co-processing, recycling, waste-to-energy conversion, and industrial symbiosis are transforming waste into valuable resources. Co-processing and recycling currently divert around 20% of waste, yet over 80% is still landfilled due to low costs and infrastructural gaps. Challenges such as limited awareness, inadequate infrastructure, and weak policy enforcement hinder optimal waste management. The paper recommends awareness campaigns, infrastructure upgrades, and technology transfer to overcome these barriers. Efficient management of biomass and organic waste can significantly contribute to achieving Sustainable Development Goals and advancing a circular economy.
- Ghosh, A. (2023) [5] demonstrated that the pivotal role of energy in economic development and the urgency to transition from nonrenewable to renewable sources. It notes that over a billion deaths annually are linked to air pollution, largely from fossil fuels and improper waste disposal. Proper segregation of solid waste can yield valuable resources like plastic-to-fuel and biogas. Emphasis is placed on solar, wind, and biomass as sustainable alternatives. The paper reflects global goals, including India's 2070 net-zero pledge at COP26 and initiatives in Budget 2022, stressing that converting waste to renewable energy is crucial for environmental and economic sustainability.
- Panigrahi and Patnaik (2023) [8] studied that integrating skill development with waste management at ITI Berhampur, Odisha, highlights an innovative circular economy model converting approximately 1,000 kg of monthly scrap—metal, e-waste, automobile parts, and plastics—into valuable sculptures and art. This approach addresses environmental pollution and skill gaps by engaging trainees in practical, multi-trade teamwork, enhancing their employability and entrepreneurship. Over five years, placements rose from 602 to 1,425, with average salaries doubling from ₹11,500 to ₹22,800. Increased admissions, especially among girls (427 to 734), underscore the program's social impact and sustainability potential across India's 13,000 vocational institutes.
- Chenavaz and Dimitrov (2024) [3] explores that circular economy as a solution to the global waste crisis, addressing over 2.01 billion metric tons of municipal solid waste generated annually (World Bank, 2018). Drawing from case studies and literature, it critically assesses policy instruments—regulatory (e.g., extended producer responsibility), economic (e.g., environmental taxes), and voluntary (e.g., eco-labeling). It also identifies key barriers: cultural, economic, and logistical. While circular energy devices and recycling technologies offer promise, their real-world applicability remains underexplored. The literature reveals a policy-implementation gap, highlighting the need for integrated strategies to enable scalable, sustainable circular economy transitions worldwide.
- Mondal and Singh (2024) [7] found that the role in transforming waste into valuable resources amid rapid industrialization and environmental challenges. Moving away from traditional linear models, circular economy principles focus on reuse, reduction, and regeneration to address waste management, pollution, and climate change. Waste entrepreneurship fosters environmental, social, and economic sustainability by enhancing resource efficiency and driving innovation in product design and supply chains. Government policies and incentives are crucial to overcoming barriers and accelerating this transition, aligning these efforts with the United Nations Sustainable Development Goals (SDGs).
- Singh and Srivastava (2024) [10] studied that India's legal framework supporting waste-to-wealth conversion through industrial recycling and waste management. It highlights policy tools like tax relief and public procurement to promote technological innovations in recycling. It emphasizes the role of technology in enhancing recycling efficiency and advocates for improved legal incentives. using recycled materials in DIY landscaping can save up to 40% on decoration costs while promoting sustainability. The review cites the need for economic restructuring to support circular economy goals and recommends global best practices, such as extended producer responsibility, to transition from linear to circular waste management in India.
- Karim *et al*., (2025) [6] emphasized that urgent need to shift from a linear "take-make-dispose" waste management model to a circular economy framework to address rising global waste, which is expected to double by 2050. Currently, solid waste decomposition contributes about 5% to global greenhouse gas emissions, with 11.2 billion tons generated annually. The circular economy approach promotes resource preservation through reuse, recycling, and repurposing, fostering environmental protection and economic growth. Integrating technological innovation, policy reforms, and community engagement is critical for sustainable waste management, helping to mitigate environmental degradation while advancing global sustainability goals.

Methodology

Sample Selection – A sample of 30 respondents werer randomly selected from teaching and non-teaching staff of COCS, Hisar, Haryana. The sample was include individuals

from various departments to ensure diverse perspectives on household waste reuse for landscaping, promoting sustainable campus beautification.

Material Selection – Identifying common household waste materials that can be repurposed for landscaping, such as plastic containers, glass bottles, and organic compost.

Design Planning – Developing creative landscaping designs that incorporate waste materials for aesthetic and functional purposes.

Implementation – Constructing and integrating waste-based landscaping elements into the COCS campus garden.

Observation & Evaluation – Assessing the effectiveness, and visual appeal of the implemented landscaping features over time.

Table 1: Variables and Their Measurements

Independent Variables	Measurements
Age	Chronological age
Gender	Schedule was developed
Occupation	
Department	
Highest Educational Qualification	
Marital Status	
Dependent Variables	
Aesthetic Appeal / Visual Rating	Schedule was developed
Environmental Benefit	

Data Collection

- **Surveys & Interviews:** Gathering insights from faculty on their perspectives regarding DIY waste-based landscaping.
- **Photographic Documentation:** Capturing before-and-after images of the landscaped areas to visually document the transformation.

Different Do it yourself products

Results

Table 1: Demographic Information

Category	Subcategory	Frequency	Percentage ( )
Gender	Male	7	23.3
	Female	23	76.7
Occupation	Teaching Staff	14	46.7
	Non-Teaching Staff	16	53.3
Residential Area	Urban	20	66.7
	Rural	10	33.3
Marital Status	Single	13	43.3
	Married	17	56.7
Education Level	Bachelor's Degree	10	33.3
	Master's Degree	12	40.0
	Doctorate/Other	8	26.7

Demographic Profile of Respondents

Table 1 presents a comprehensive demographic breakdown of the 30 respondents who participated in the study. A majority of the participants were female (76.7), while male respondents constituted only 23.3 of the sample. Occupational data reveals a nearly even split, with 53.3 of participants belonging to non-teaching staff and 46.7 to teaching staff. Regarding residential status, a dominant share of respondents (66.7) reside in urban areas. In terms of marital status, 56.7 of respondents are married, while 43.3 are single. Educational qualifications show a varied academic background among respondents: 40.0 hold Master's degrees, 33.3 have Bachelor's degrees, and 26.7 possess a Doctorate or equivalent. The majority of participants with postgraduate qualifications indicates a well-educated sample.

Table 2: Before DIY Enhancement of Display Boards

Statement	Disagree n(%)	Neutral n(%)	Agree n(%)
1. Visually appealing	12(40.0)	10(33.3)	8(26.7)
2. Information clear and well-organized	9(30.0)	13(43.3)	8(26.7)
3. Regularly updated	14(46.7)	9(30.0)	7(23.3)
4. Creative design	11(36.7)	12(40.0)	7(23.3)
5. Free from clutter	13(43.3)	10(33.3)	7(23.3)
6. Convenient locations	8(26.7)	11(36.7)	11(36.7)
7. Easy to read from distance	10(33.3)	12(40.0)	8(26.7)
8. Attractive colors	9(30.0)	11(36.7)	10(33.3)
9. Encourages interaction	15(50.0)	10(33.3)	5(16.7)
10. Provides useful info	8(26.7)	12(40.0)	10(33.3)

Table 2 reveal that the display boards were largely perceived as ineffective prior to DIY enhancement. Half of the respondents (50.0%) disagreed that the boards encouraged interaction, and 46.7% felt they were not regularly updated. A significant number also disagreed that the boards were free from clutter (43.3%) or visually appealing (40.0%). Creativity, readability, and organization received mixed responses, with relatively low agreement. However, aspects like location (36.7% agreement) and useful information (33.3% agreement) were viewed more positively. Overall, the data indicate a need for improvement in design, clarity, and user engagement of the display boards. Most responses were either disagreeing or neutral, indicating moderate to low satisfaction with the current state of display boards before the DIY enhancement.

Table 3: After DIY Enhancement (Expected Changes)

Statement	Disagree n (%)	Neutral n(%)	Agree n(%)
1. More visually appealing	2(6.7)	6(20.0)	22(73.3)
2. Attract student attention	3(10.0)	5(16.7)	22(73.3)
3. More organized	1(3.3)	8(26.7)	21(70.0)
4. More readable information	1(3.3)	7(23.3)	22(73.3)
5. Creative use of eco-friendly materials	0(0.0)	5(16.7)	25(83.3)
6. Promote student creativity	2(6.7)	6(20.0)	22(73.3)
7. Represent department identity	1(3.3)	8(26.7)	21(70.0)
8. Motivate student engagement	1(3.3)	9(30.0)	20(66.7)
9. Teach creative techniques	1(3.3)	5(16.7)	24(80.0)
10. Positive impression on visitors	1(3.3)	6(20.0)	23(76.7)

Table 3 indicate a highly positive response to the expected changes after the DIY enhancement of display boards. A large majority agreed that the boards became more visually appealing (73.3%), attracted student attention (73.3%), and presented more readable information (73.3%). Most respondents (83.3%) appreciated the creative use of eco-friendly materials, while 80.0% agreed that the boards taught creative techniques. Additionally, over 70% felt the enhancements represented departmental identity and promoted student creativity. Overall, responses show strong support for the DIY initiative, highlighting its effectiveness in improving aesthetics, engagement, and educational value of the display boards. There is overwhelming agreement (most in "Agree" category) on the anticipated benefits of using DIY and upcycled materials in display board enhancement.

Table 4: Current State of Notes Boards (Before DIY Enhancement)

Statement	Disagree n (%)	Neutral n (%)	Agree n (%)
1. Easily accessible	5 (16.7)	10 (33.3)	15 (50.0)
2. Important notices are visible/readable	8 (26.7)	12 (40.0)	10 (33.3)
3. Regularly updated	12 (40.0)	11 (36.7)	7 (23.3)
4. Layout is organized/systematic	10 (33.3)	13 (43.3)	7 (23.3)
5. Font size is readable	6 (20.0)	9 (30.0)	15 (50.0)
6. Board has clean/tidy appearance	9 (30.0)	12 (40.0)	9 (30.0)
7. Notices are well-arranged (not overcrowded)	13 (43.3)	9 (30.0)	8 (26.7)
8. Easy for students to add/remove notices	15 (50.0)	10 (33.3)	5 (16.7)
9. Content is relevant to student needs	6 (20.0)	12 (40.0)	12 (40.0)
10. Located in a spot accessible to all students	4 (13.3)	8 (26.7)	18 (60.0)

Table 4 indicate mixed perceptions of the notice boards before DIY enhancement. While 50.0% found the boards easily accessible and the font size readable, only 23.3% agreed they were regularly updated or systematically organized. Half of the respondents (50.0%) disagreed that students could easily add or remove notices, and 43.3% felt the boards were overcrowded. Cleanliness and relevance of content received balanced feedback. Notably, 60.0% agreed the boards were located in accessible spots. Overall, the data suggest usability and content relevance were moderate, but there was a clear need for improvement in layout, update frequency, and student accessibility.

Table 5: Notes Boards Expected Changes After DIY Enhancement

Statement	Disagree n (%)	Neutral n (%)	Agree n (%)
1. More visually appealing	1 (3.3)	4 (13.3)	25 (83.3)
2. Creative designs will improve attractiveness	1 (3.3)	5 (16.7)	24 (80.0)
3. Information will be better organized	2 (6.7)	6 (20.0)	22 (73.3)
4. DIY designs promote environmental sustainability	0 (0.0)	5 (16.7)	25 (83.3)
5. Will encourage student creativity and participation	1 (3.3)	6 (20.0)	23 (76.7)
6. Will look cleaner and more professional	0 (0.0)	4 (13.3)	26 (86.7)
7. Students will be motivated to maintain the board	2 (6.7)	6 (20.0)	22 (73.3)
8. Space will be effectively used for notices	1 (3.3)	5 (16.7)	24 (80.0)
9. Recycled materials will be creatively used	0 (0.0)	3 (10.0)	27 (90.0)
10. Will leave a positive impression on visitors	0 (0.0)	4 (13.3)	26 (86.7)

Table 5 expected changes after the DIY enhancement of notice boards received overwhelmingly positive responses. Most respondents agreed the boards would become more visually appealing (83.3%) and creatively designed (80.0%), improving overall attractiveness and organization (73.3%). Environmental sustainability through DIY designs was highly supported (83.3%), as was the creative use of recycled materials (90.0%). Respondents also believed the boards would look cleaner (86.7%), encourage student creativity (76.7%), and better utilize space (80.0%). Furthermore, the enhancements were expected to motivate students to maintain the boards and leave a positive impression on visitors, signaling strong confidence in the project's benefits.

Table 6: Comparing the "Before" and "After" DIY enhancement of Display Boards

Statement	Mean (Before)	Mean (After)	Mean Difference	t (value)
1. Visually appealing/ More visually appealing	1.87	2.67	+0.80	9.22
2. Information clear and well-organized/ Attract student attention	1.97	2.63	+0.66	8.05
3. Regularly updated/ More organized	1.77	2.67	+0.90	9.65
4. Creative design/ More readable information	1.87	2.70	+0.83	9.10
5. Free from clutter/ Creative use of eco-friendly materials	1.80	2.83	+1.03	10.42
6. Convenient locations/ Promote student creativity	2.10	2.67	+0.57	7.28
7. Easy to read from distance/ Represent department identity	1.93	2.63	+0.70	8.67
8. Attractive colors/ Motivate student engagement	2.03	2.77	+0.74	8.91
9. Encourages interaction/ Teach creative techniques	1.67	2.77	+1.10	10.75
10. Provides useful info/ Positive impression on visitors	2.07	2.70	+0.63	7.94

Table 6 t-test results reveal significant improvements in all evaluated aspects of the display boards after DIY enhancement. Mean scores increased notably, with the largest mean difference seen in encouragement of interaction/teaching creative techniques (+1.10) and free from clutter/creative use of eco-friendly materials (+1.03). Other key areas such as visual appeal (+0.80), organization (+0.90), and attractiveness (+0.74) also showed strong positive shifts. All t-values were highly significant ($p < 0.001$), indicating these changes are statistically reliable and reflect a substantial enhancement in user perception following the DIY improvements.

Table 7: Comparing the "Before" and "After" DIY enhancement Notes Boards

#	Statement	Mean (Before)	Mean (After)	Mean Difference	t-value
1	Accessibility / Visual appeal	2.33	2.80	+0.47	5.37
2	Notice visibility / Creativity	2.07	2.77	+0.70	6.94
3	Regular updates / Better organization	1.83	2.67	+0.84	8.13
4	Organized layout / Sustainability	1.90	2.83	+0.93	8.62
5	Readable font / Encourages creativity	2.30	2.73	+0.43	4.58
6	Clean appearance / Professional look	2.00	2.87	+0.87	9.21
7	Overcrowding / Motivation to maintain	1.83	2.67	+0.84	7.83
8	Easy notice management / Effective space use	1.67	2.77	+1.10	10.51
9	Relevant content / Recycled materials	2.20	2.90	+0.70	7.35
10	Good location / Positive impression	2.47	2.87	+0.40	4.37

Table 7 indicates that t-test results significant improvements in all aspects of notice boards after the DIY enhancement. The largest mean difference (+1.10) was observed in easy notice management and effective space use, followed by organized layout/sustainability (+0.93) and clean appearance/professional look (+0.87). Other notable improvements include regular updates/better organization (+0.84) and motivation to maintain boards (+0.84). Even the smallest changes, such as good location/positive impression (+0.40), were statistically significant. Overall, all improvements showed strong t-values, indicating high confidence that the DIY enhancements positively impacted the boards' functionality, appearance, and student engagement.

Summary

The research paper titled "Waste-to-Wealth: Using Household Waste in DIY (Do it Yourself) Landscaping" explores an innovative approach to sustainability through the creative reuse of household waste for landscaping and beautification of display and notice boards at the College of Community Science, Hisar. The study employs the concept of "Waste-to-Wealth," emphasizing the transformation of waste materials such as plastic bottles, glass containers, and organic compost into aesthetically appealing and functional design elements through DIY techniques. Quantitative results showed significant improvements in visual appeal, organization, and sustainability after the DIY enhancements. For instance, display boards saw an increase in mean visual appeal scores by +0.80 (t=9.22), while creative use of eco-friendly materials rose by +1.03 (t=10.42). Similarly, notice boards improved in ease of notice management (+1.10, t=10.51) and cleanliness. Survey responses reflected a strong shift in user satisfaction and motivation. Over 80% of participants agreed that the redesigned boards were more visually appealing, better organized, and effectively used recycled materials. The enhancements also fostered greater student creativity and environmental awareness.

The study concludes that DIY landscaping using household waste not only contributes to sustainable campus development but also promotes resourcefulness, community engagement, and environmental consciousness. This low-cost, creative strategy serves as a replicable model for other educational and community institutions aiming to integrate sustainability into everyday practices. The research highlights the potential of waste as a valuable resource when combined with innovation and community participation, aligning with global efforts to reduce environmental impact and encourage responsible consumption.

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