DMPedia Lecture Notes in Computer Science & Engineering
Volume 1, pp. 235-241, 2026

International Conference on Multidisciplinary Perspectives in Advanced Computing and Technology (IMPACT 2026)
G. B. Pant University of Agriculture and Technology, Uttarakhand, India. Jan. 10-11, 2026

Empowering Lower-Middle-Class Communities for Climate Action via a Reward-Based Web Platform

Anuj Bhakat, Aman Pandey, Amit Kumar Rai

Department of Computer Science & Engineering, SSCSE, Sharda University, Greater Noida, UP, India

2023451688.anuj@ug.sharda.ac.in, 2023372867.aman@ug.sharda.ac.in, amit.rai@sharda.ac.in

ABSTRACT

Generally, there is a complete lack of awareness about climate issues among lower-middle-class and middle-class people due to the lack of relatable incentives and learning tools. A web-based platform prototype has been developed to encourage sustainable behavior through gamified challenges and community participation. Responses from about twenty individuals from lower-middle-class backgrounds were collected before the design phase to understand what motivated them and what concerns they had with eco-friendly practices. The findings showed that most participants were primarily interested in financial benefits and would be more likely to adopt green actions if tangible rewards were offered. Informed by this, the proposed website includes a reward-based mechanism whereby users earn "green points" for completing environmental challenges, which can later be used to purchase eco-friendly products. This prototype was presented to selected participants, who provided feedback on the reward mechanism's capabilities and the interactive features' potential to enhance engagement. These early results show that reward-based digital platforms can play a meaningful role in encouraging sustainable habits in communities with limited financial resources.

Keywords: *Climate awareness, web technologies, gamification, sustainability, lower-income communities, incentive-based rewards.*

1. Introduction

Climate change is not the least urgent problem of the twenty-first century, and its consequences impact the environment, human health, and socio-economic stability on a large scale. As recent research shows, gamified and immersive experiences (especially those involving VR and AR) can be particularly effective at raising climate awareness and motivating more people to take sustainable steps, especially younger viewers and groups that have traditionally been less concerned about climate change [1]. Meanwhile, studies indicate that economically deprived people tend to focus on short-term financial interests than long-term environmental issues, which means that they can hardly easily embrace any form of sustainable practice in the absence of viable incentives [2].

The concept of digital platforms with gamification has become a promising approach to promoting pro-environmental behavior, although most of the existing models do not take into consideration the financial incentives that have a strong impact on decision-making among low-income populations [3]. Although obstacles, incentives, and interpersonal communication can be helpful in closing the gap between awareness and action, there are no solutions that would specifically target communities with limited economic resources.

To fill this gap, the current research presents and discusses a prototype web-based platform developed for the lower-middle-class customers in India. An informal interview with approximately 20 respondents suggested that the financial incentives and benefits that could be redeemed were the primary factors driving people to engage in eco-friendly actions. Based on these understandings, the platform will include gamified environmental challenges, a reward system based on green points that could be exchanged for sustainable products, and a community where users can discuss their progress. Even though the project is at the prototype

stage, initial feedback is encouraging, as people were widely engaged and responded positively to the reward mechanism. The paper is related to sustainability-oriented digital intervention because it shows how socio-technical frameworks with incentives can help spread climate awareness and use sustainable behaviors in economically restricted societies [4].

Alignment with United Nations SDGs

The platform promotes important United Nations Sustainable Development Goals by inviting action in practice, at the community level, regarding the environment. It supports SDG 13 (Climate Action) by addressing climate-related challenges that encourage users to take action, such as local cleanups, small-scale environmental changes, and similar activities. The reward system that enables users to earn green points to receive products that help reduce environmental impact aligns with SDG 12 (Responsible Consumption and Production) because it encourages people to make environmentally friendly purchases. Also, the platform helps to promote community engagement and co-ownership, which are in the spirit of SDG 11 (Sustainable Cities and Communities), because the visible participation of the user tends to attract the neighbors into environmental campaigns.

Table 1: Mapping of platform components to SDG targets, demonstrating how digital engagement supports measurable community-level sustainability outcomes.

Platform Feature	SDG Target	Real-World Example
Clean-up challenges	SDG 11, SDG 13	Neighborhood clean-ups, reduced local pollution
Green product redemption	SDG 12, SDG 13	Households choosing reusable products, reduced plastic waste
Community sharing	SDG 11	Neighbors inspired to join clean-ups and environmental action
Waste reduction tasks	SDG 12	Segregation, composting, minimizing landfill waste

2. Literature Review

Awareness of climate change has increased in India, yet the communities in lower- and middle-income sectors still prioritise immediate financial demands over environmental issues [5], [6]. Consequently, the most effective interventions have to merge the informative message with practical rewards that will be attractive to groups with limited financial resources [4], [7]. Studies also indicate greater effectiveness in long-term behaviour change in cases where platforms have tiered rewards, ongoing feedback and recognition that resonate with user values and local conditions [1].

Digital technologies, in particular web platforms and gamified systems, have shown significant potential for promoting pro-environmental behaviour. The VR- and AR-based experiences also have the ability to raise awareness about climate change and motivate people towards sustainable behavior, especially amongst a younger or less-engaged audience. Points, challenges, and rewards have also been found consistently to increase user engagement in many studies [1], [2], [3]. India also suggests that sustainable consumption can be promoted through such tools, with recent studies showing that most current platforms tend to target urban, higher-income populations [4], [5]. Furthermore, reward systems tied to concrete goods, such as environmentally friendly products, can go a long way toward enhancing engagement in green activities [6], [8].

Based on this analysis, this paper presents a prototype website designed to meet the needs of lower-middle-income consumers in India. The semi-structured interviews involving approximately 20 people helped reveal that financial incentives and redeemable rewards were major motivational factors in taking environmentally friendly steps. According to this feedback, it will be possible to incorporate gamified challenges, a system based on green points as rewards, and a community for sharing progress. Initial screening indicates a strong appeal to the reward system, suggesting long-term involvement. The paper presents an early socio-technical intervention targeting a previously neglected population segment, and gives the first indications that incentive-driven media-technology can encourage pro-sustainable behavior among lower-income Indian groups [7], [9], [10].

3. Methodology

The suggested web-based platform will aim to raise awareness about climate in the lower-middle-class users in India through gamification, social interactions, and physical rewards. The system supports two user types: creators (organisers) and regular users. The creators will have the duties of listing eco-friendly products and officiating on user submissions on challenges and normal users will be involved in challenges because they will earn points that can be redeemed to purchase eco-friendly products.

3.1 User Roles and Responsibilities

The site has two user classes: creators and ordinary users. Creators run the green products to be redeemed and inspect the submissions of challenges. They confirm completed tasks, award green points, and track activity to ensure fairness. Ordinary users are invited to take on challenges (clean-ups, small gardening work, and waste reduction) and post evidence to earn green points. They are also involved in the community section, sharing updates and communicating with peers, which is useful for maintaining motivation and competition among peers.

3.2 Incentive System and Gamification

The platform employs a number of gamified elements in order to attract continued interaction. Such challenges every day and weekly contribute to environmentally-friendly behavior, with the help of reminders and badges of achievement. Authenticated posts earn green points, which users can redeem for environmentally friendly products. A leaderboard helps to bring a friendly competition where the best performers are showcased and the community section allows users to share progress, interact with others, and build on the habit of participation.

3.3 Data Collection and Prototype Testing

Data were obtained within the framework of the methodology by surveying 20 middle-class residents of Greater Noida, aged 22-55. Their professional backgrounds were typical of the average level of economic diversity: about half were daily-wage workers, and the rest were engaged in small-scale self-employment. The vast majority of them were based on low-cost Android devices, further supporting a mobile-first platform that can be used on low-end devices.

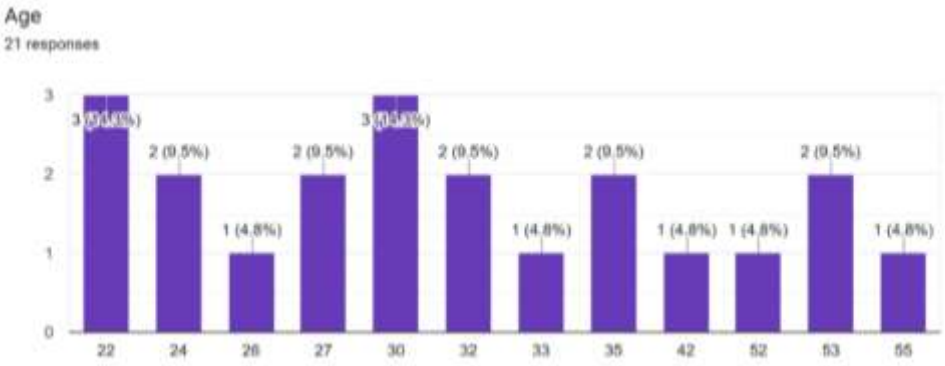

Figure 1: Age Distribution Bar Graph

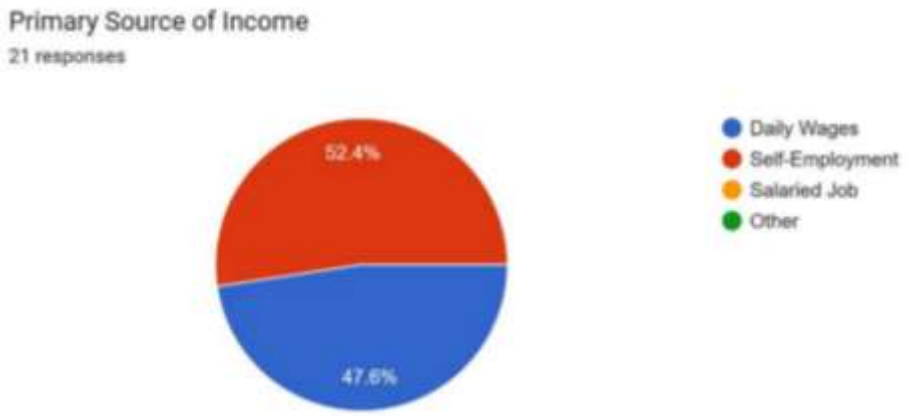

Figure 2: Income Distribution Pie Chart

The first survey results indicated that many people were interested in financial incentives but were less aware of basic climate-friendly practices. Other respondents felt that meaningful environmental action required expensive technology or a large organisation, and that practical, simple instructions were needed.

During prototype testing, participants completed sample challenges, communicated within the community section, and provided usability feedback. Creator reviewed these submissions and assigned points, and the system automatically tracked challenges completed and user interactions.

3.4 System Architecture and Verification Workflow

The site was built as a lightweight, scalable, web-based application that could run on low-end gadgets used in lower-middle-class societies. It has a mobile-friendly frontend, a modular backend, and a secure Supabase database.

The UI provides a simple interface with challenge cards, progress indicators, leaderboards, and a community activity feed. On the other hand, the back-end handles submissions for challenges, reward redemptions, user authentication, and the allocation of green points. It has a modular structure that facilitates easy communication between parts and can be expanded in the future. There is fairness in a well-defined verification process. Users post photos or short videos as evidence, which are displayed in the creator dashboard for viewing. Submissions that are approved receive green points instantly, whereas rejected ones receive brief feedback.

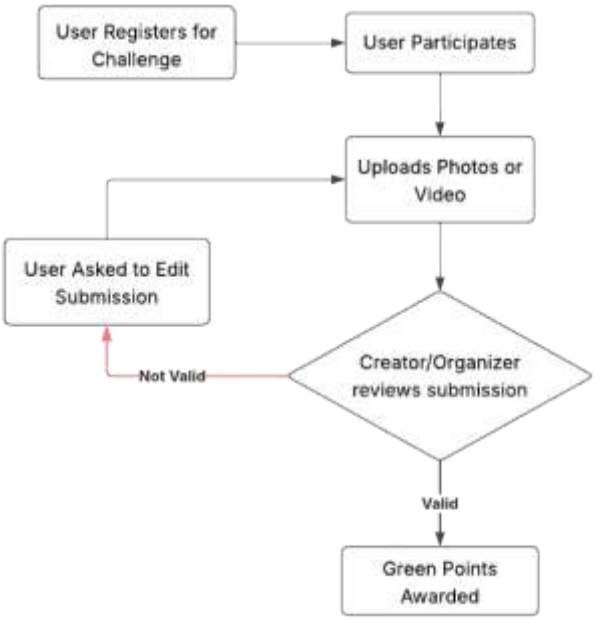

Figure 3: Challenge verification workflow showing how a user's participation is reviewed, and green points are allocated.

3.5 Ethical Considerations

Before data collection, participants were informed of the study's purpose and provided consent. Information was collected only as needed to evaluate the prototype. Photos uploaded in the course of the verification were reviewed anonymized to avoid any identity disclosure, and no personalized information was saved. All the records were stored safely and selectively. Given that the study was not risky and that the environmental activities were conducted daily, it met the low-risk research criteria. The privacy of the participants and the responsible data handling were upheld during the process.

4. Results and Discussion

The prototype was tested with 21 respondents from the lower-middle class to evaluate its usability, engagement, and the influence of its gamified and reward-based capabilities.

4.1 User Engagement with Challenges

Every participant (100% of all the participants) managed to accomplish one of the challenges, and approximately eighty-five per cent were able to accomplish several tasks. Local cleansing, small-scale gardening, and rubbish minimisation were deemed easy and feasible, which helped to maintain constant attendance. Participation was also enhanced when people started communicating in the community section and informational cues were used to eliminate the misconceptions about climate. Such trends align with results suggesting that participation in sustainability programs is enhanced by accessible, low-effort tasks [4], [5].

4.2 Effectiveness of the Green Points System

The Green Points System was a significant motivator; almost 90% of users stated that redeemable points made them want to complete more challenges, which supports the idea

that financial or material rewards are very important in the behaviour of lower-income populations [4], [5], [6]. Competition was also fostered by the leaderboard's friendly nature, which aligns with gamification research showing that social comparison boosts engagement [1], [2].

4.3 Community Engagement

Users would post photos and updates on progress, and as community activity increased, so did the number of challenges completed. The peer visibility and encouragement made a significant contribution, reinforcing studies that found that social factors enhance engagement with sustainability-oriented platforms [1], [2], [4].

4.4 Feedback from Creators

The system was quite convenient for creators in terms of reviewing submissions, allocating points, and managing environmentally friendly product listings. They identified that more automation in verification would be necessary for large-scale deployment, as reflected in the recommendations of reward-based research on digital interventions [1].

4.5 Discussion

The findings suggest that combining gamified challenges with real-world incentives and community engagement is effective in promoting climate-friendly behaviour among lower-middle-class users. It was the rewards that were used to overcome financial barriers, the leaderboard and challenges that ensured participation continued, and peer interaction enhanced motivation. These results can be attributed to previous research that has placed an emphasis on the importance of incentives and social characteristics in the change of behavior [2], [4], [6]. But wider use will involve automation, bigger sample sizes and longer tests.

5. Conclusion

This research proposed and tested a prototype web-based application to encourage middle-income users (lower middle) in India to be more aware of climate change. The combination of gamified challenges, the use of rewards as a form of incentives, and socialization demonstrated good engagement, and the participants completed the tasks and reacted positively to the point-based system. The study has several limitations despite the initial findings' positives. The prototype was tested with a small group of participants, and the results could not be generalised. The short test time also does not allow for concluding on long-term behavioural change, and the existing manual verification could not be scaled efficiently. Further work should expand the range of users and include more diverse users, extend the evaluation time frame, and automate challenge checking and reward payment. The effects of the platform could be increased by adding more activities, the use of multilingual assistance, and collaborating with other local organizations. As it is further refined, the system can be used to sustain lifestyle changes in broader communities.

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