

Creating Sustainable Futures: A Community-Centric Approach to Environmental Awareness and Action with Latinos in Minnesota

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Prepared by



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Hispanic Advocacy and Community Empowerment through Research

HACER's mission is to engage Latino Minnesotans through research, evaluation, and community action to promote equitable representation at all levels of institutional decisions and policy change.

Executive Director: Rodolfo Gutiérrez
HACER 155 Wabasha St. S., Ste 105
St. Paul, MN 55107
954-240-0821
www.hacer-mn.org

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HACER Project Staff

Rodolfo Gutiérrez (Executive Director)
Carolina De La Rosa Mateo (Director of Operations)
Ericka Lara Ovaes (Research and Evaluation Coordinator)
Rodrigo Escobar (Research Associate)
Rodrigo Gutiérrez (Research Associate)
Zadkiel Molina (Digital Communications Manager)
Estrella Ramírez (Digital Communications Specialist)
Jacqueline Portillo (Administrative Assistant)





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Creating Sustainable Futures: A Community-Centric Approach to Environmental Awareness and Action with Latinos in Minnesota

Executive Summary



Aims		Methodology	
	This study focused on engaging the Latino community in the Twin Cities and Southern Minnesota in environmental activities with the purpose of uncovering further challenges to achieve equitable participation in environmentally sustainable practices.		Mixed-methods approach which included group design sessions, educational interventions, and participatory action. The final phase, a sustainable living challenge, aimed to identify specific successes and challenges faced by the Latino community in adopting eco-friendly habits.
Findings			
	Interest in Environmentally Sustainable Actions Participants voiced a strong desire to engage in environmentally sustainable practices to address climate.	Barriers to Continued Engagement Knowledge gaps and resource limitations emerged as significant barriers, highlighting the need for focused interventions to address accessibility and equity concerns.	Exploration Following the Challenge Participants highlighted the challenge's success in deepening environmental awareness and fostering a sense of community through shared goals and learning.
Conclusion			
	Engaging the Latino community through culturally aligned education and participatory actions proved highly effective in sparking a strong interest in environmental sustainability. Despite inherent challenges, the commitment displayed by participants underscores a profound desire for change. To capitalize on this momentum, future initiatives should: <ul style="list-style-type: none">• Prioritize inclusive strategies: Ensure equitable access and participation for all community members.• Allocate adequate resources: Invest in programs and infrastructure that address identified needs and barriers.• Develop tailored programs: Design culturally relevant sustainability initiatives that resonate with and empower community members. By embracing collaboration and implementing these recommendations, local environmental programs can drive significant progress towards environmental consciousness and equity across communities.		

Introduction

Overview of HACER's Study

This study emerges from the findings gathered in a recent HACER investigation, *Perceptions of climate change in Latino Minnesotans*, highlighting substantial concerns within the Latino community in Minnesota regarding the immediate and future impacts of climate change. Notably, the investigation revealed that Spanish-speaking participants had no previous knowledge of climate action efforts during that study, indicating a notable lack of accessible information.

In response, this study attempts to engage the Latino community in the Twin Cities and Southern Minnesota in a series of environmental activities. The study has a dual focus, **aiming to foster sustainable and equitable practices within the Latino community while delving into the specific successes and challenges faced in integrating eco-friendly habits into daily life.** By engaging in these activities, this study seeks to understand and promote environmentally conscious behaviors while addressing the informational gaps in the community.

Representation in Climate Action

Literature on equitable representation in the environmental justice movement demonstrates a lack of representation of Black, Indigenous, and People of Color (BIPOC) communities. (Davis and Ramírez-Andreotta, 2021; Kohl, 2020). Drawing from HACER's previous report, Latinos in Minnesota feel they are not adequately represented in the climate movement due to the lack of reliable information and the limited resources available in Spanish. Environmental solutions frequently overlook individuals who bear a disproportionate burden of environmental injustices, often prioritizing the perspectives of those less affected (Kohl, 2020). Even when these marginalized communities speak up, big corporate lobbying efforts

tend to have more financial and legal power, which often leads to their concerns being overlooked. Consequently, communities living with the impact of environmental pollution are further discouraged from taking action (Davis and Ramirez-Andreotta, 2021).

Additionally, government policies and practices have promoted an unequal playing field that adds more barriers for BIPOC communities to achieve a clean and healthy environment. Case in point, the Minnesota Pollution Control Agency (MPCA) has identified areas of environmental justice concern in the state. These areas encompass communities where over half the population are BIPOC, more than 40% of households earn less than 185% of the federal poverty level, and locations are characterized by elevated air pollution and increased exposure to industries that contribute to environmental degradation (House-MN Health Professionals for a Healthy Climate, 2021). This configuration translates into Minnesotans of Color experiencing a shorter lifespan, higher rates of infant and maternal mortality, and a higher incidence of heart disease, cancer, asthma, diabetes, and other diseases compared to white Minnesotans (House-MN Health Professionals for a Healthy Climate, 2021).

Members of these populations not only encounter environmental risks but also demonstrate greater susceptibility to their consequences. This increased vulnerability, compared to the wider population, arises from several factors, including limited understanding of environmental hazards, exclusion from political processes, and diverse socioeconomic considerations (Institute of Medicine, 1999).

As a research organization, HACER recognizes the growing importance of this issue and reaffirms its commitment to addressing this matter that holds significance for our community. This research project was designed to amplify and facilitate the voices of the Latino community in

Minnesota in the environmental sphere, while promoting a healthy environment for all. Thanks to the generous contribution and commitment of the Mortenson Family Foundation, HACER successfully conducted a project with the following objectives:



Amplifying the voices of Latino community members in addressing environmental issues by leveraging their experiences and creativity to shape the study's activities and topics, ensuring relevance of the project to participants.



Promoting involvement in sustainable actions by sharing information about sustainability issues and practices in Spanish, aiming to encourage active participation in these initiatives.



Equipping participants with tools for practical and sustainable lifestyle changes, fostering their role as advocates for environmental justice and encouraging them to share this knowledge with their social circles.

Methodology

The purpose of this mixed methods study was to encourage the Latino community to engage in environmentally sustainable and just practices. This project consisted of three phases that included (1) group design sessions, (2) educational interventions, and (3) participatory action.

Group Design Sessions

In the first phase, a creative participatory research approach (Goodwin, J., Savage, E. and O'Donovan, A., 2023), using the “draw and tell” method was applied to collect participants' vision for creating environmentally just communities and their perceived challenges. “Draw and tell” involves engaging participants with prompts to draw their answers and then reflect on what motivated their artistic expression. This method encourages active engagement from all participants and facilitates an even deeper expression of the topic. The “draw and tell” method is also useful in overcoming language barriers which is beneficial given the different levels of proficiency in English and Spanish of the group's intended audience.

Phase 1

For this project, the images produced by participants were not examined; rather the reflection and conversations the participants had – using their drawings as a springboard – were analyzed through an inductive coding approach using Microsoft Excel.

Phase 2	<p>Educational Intervention</p> <p>The themes gathered from the first phase served as the building blocks for the content of the educational workshops in the second phase. The goal of the educational workshops was to raise awareness about sustainable living activities among the Latino community and encourage members to apply the new knowledge by participating in the third phase of the project.</p>
Phase 3	<p>Participatory Action</p> <p>This last component was designed as a sustainable living challenge where participants would incorporate an eco-friendly activity into their daily living and report on its progress.</p> <p>The challenge intended to uncover the successes and challenges specific to the Latino community living in Minnesota in adopting environmentally sustainable practices into their daily lives. This component was evaluated through weekly tracking forms, and pre- and post-surveys administered through Google Forms. Quantitative analysis included description of participant characteristics, participation action frequencies, and pre- and post-survey response to environmental actions. Descriptive analysis was performed using Microsoft Excel, crosstabulation, and graphical display while qualitative data underwent manual inductive coding within the same platform.</p>

Supplementary materials on the structure and design of each phase can be found in Appendix A.

Results

Design Sessions: Exploring Environmental Visions

HACER conducted three design sessions—two in the Twin Cities-Metro Area and one in Southern Minnesota—to understand participants' visions for fostering an environmentally just community. The first Twin Cities session saw the highest participation with 7 attendees (6 females, 1 male), while the second Metro Area session had 5 participants (4 females, 1 male), mainly working-age individuals and mothers. The Southern Minnesota session also comprised 5 participants (3 females and 2 males), predominantly young adults attending or recently graduated from college.

Individual Reflections and Current Actions

During individual reflections, participants emphasized personal responsibility in environmental preservation, touching on species conservation and responsible waste disposal. Concerns were raised about industrial pollution, particularly water contamination. Participants acknowledged the importance of recycling despite its dependency on city services. Overall, there was general support for green habits, including the use of reusable bags and creating safe spaces for wildlife.

Community Issues

Reflections transitioned into discussions centered on public health impacts of pollution, effective recycling strategies, and proper hazardous waste disposal. Sound and light pollution were raised as community challenges, alongside a shared desire for accessible recycling information and better waste management.

Dreaming of the Ideal Community

Participants shared a collective vision of an ideal community characterized by green spaces, rooftop gardens, clean energy sources, and access to clean water as seen in [Figure 1](#). They emphasized a built environment promoting cycling and infrastructure supporting interconnectedness. Desired improvements included better local transportation, increased accessibility options, and simplified methods for reporting environmental concerns. The envisioned communities also stressed the importance of interconnectedness between social and natural elements for an ideal community.

Strategies for Transformation

Discussions concluded with an exchange of ideas and strategies for translating aspirations into reality. Participants advocated for stronger environmental legislation across municipalities, inclusive discussion platforms, and comprehensive environmental education, especially focusing on children. They underscored the need for accessible environmental information and highlighted community-based activities to promote environmental consciousness.

Collective Reflection

As the design sessions concluded, participants expressed a strong sense of unity and commitment. Despite diverse backgrounds,

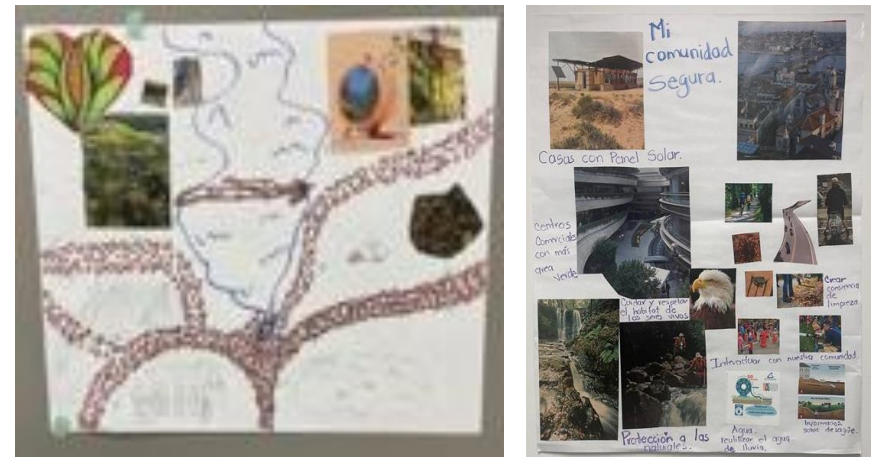


Figure 1. *Dreaming of the ideal community. a. (left) mixed collage done by Mankato design session; b (right) mixed collage done by Twin cities design session.*



there was a shared dedication to preserving the environment. Participants encouraged each other to not only to advocate for change but to embody those changes in their daily lives. Various activities, including informative flyers, online educational content, and community clean-up events, were proposed to spread awareness and involve the community.

Workshops: Creating Environmental Awareness

Guided by insights from the design sessions, HACER organized workshops focusing on environmental concerns within the Latino community. The sessions – all conducted in Spanish – included an in-person workshop in the Twin Cities and an online workshop via Facebook Live focused on Southern Minnesota.

Workshops Overview

Collectively, these sessions aimed to educate and engage participants by addressing themes of sustainable habits, renewable energy, and environmental policy. There were about 10 participants per workshop, and the Facebook Live webinar reached about 50 views. The workshops focused on sustainable habits, renewable energy adoption, environmental policy and global impact.

Each session provided opportunities for discussion and Q&A, fostering a platform for sharing insights and promoting environmental awareness within the Latino community.

Sustainable habits	Renewable energy adoption	Environmental policy and global impact
Insights and actionable tips for adopting eco-friendly practices in daily life.	Understanding steps toward transitioning to renewable energy, particularly home solar panels, both in the Twin Cities and Southern Minnesota.	Exploring the influence of policy on climate change and its implications for local communities

Sustainable Living Challenge

The sustainable living challenge generated considerable interest; however, a smaller number of individuals committed to the full challenge.

The sustainable living challenge spanned 8 weeks and allowed participants to select from four main sustainable activities:

- recycling,
- reducing disposable waste,
- composting/food waste reduction, and
- sustainable transportation methods.

Participants had the flexibility to engage in different environmental activities weekly. While initial interest was high, with over 40 registrations for the challenge, the sustained engagement involved 22 participants, with some joining for only a week or two. Ultimately, 13 participants completed the entire challenge by consistently submitting weekly tracking forms and completing both pre-and post surveys. Consequently, the results section focuses solely on the insights gathered from these 13 committed participants who completed the full challenge.



Image 1. Sample flyers used to promote the workshops

Participants actively participated in the four specified environmental focus areas, and some also embraced additional eco-friendly activities.

Throughout the sustainable living challenge, engagement levels varied across activities (Figure 2). Notably, reducing disposable waste emerged as the most popular activity, engaging 34% (n=36) of the weeks participants reported, particularly during weeks 3 (42%), 6 (43%), and 8 (50%). Participants displayed diverse efforts, such as adopting reusable bags and

containers, and showcased a concerted effort to minimize single-use plastics. Recycling garnered the interest of 28% (n=30) of participants during the observed weeks, reaching its peak at 42% in week 2. However, engagement in this activity was reduced in the final two weeks, with participation rates dropping to 15% and 14%, respectively. Participants demonstrated active involvement by sorting recyclables and seeking guidance on recycling, especially for items like glass jars.

28% of participants recycled during the challenge


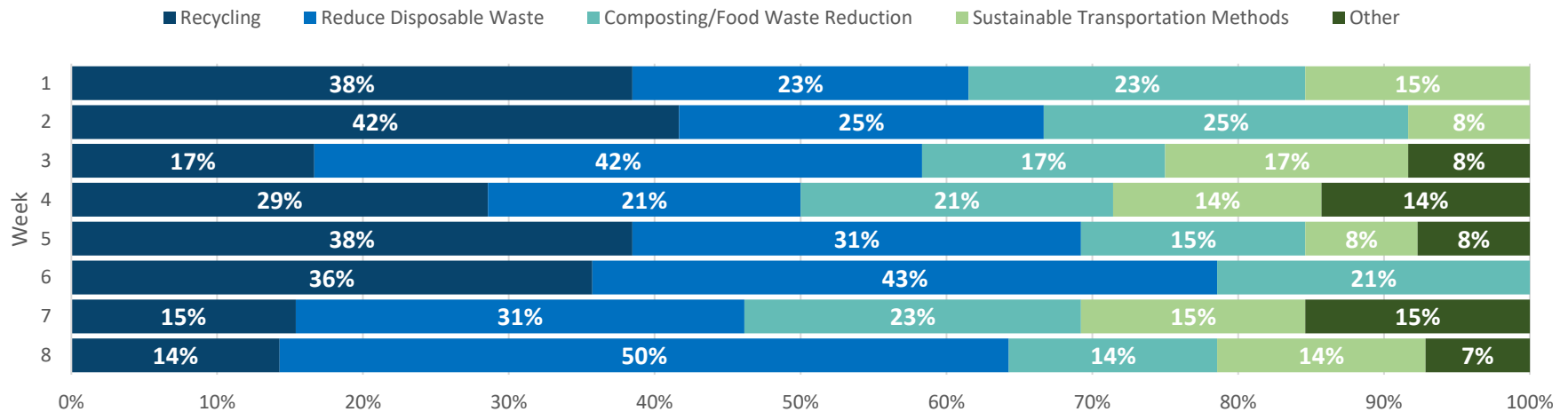



Figure 2. Reducing disposable waste was the most consistent activity chosen for the sustainability challenge across eight weeks

Activities centered on composting/food waste reduction and Sustainable transportation methods demonstrated lower overall participation, involving 20% (n=21) and 11% (n=12), respectively, across the reported weeks throughout the challenge. Food waste reduction included actions such as clearing refrigerators for composting leftovers, showcasing a dedication to waste minimization. Sustainable transportation methods encompassed public transport use and carpooling, indicating participants' eco-conscious commuting efforts.

Moreover, participants engaged in other eco-friendly actions, including maintaining small gardens, reducing water consumption, and favoring homegrown produce, contributing positively to sustainable practices.

Participants experienced an overall positive journey throughout the weekly development of the challenge.

The participants consistently expressed positive sentiments about their engagement in the weekly challenge activity, with the average experience falling between "great" and "average" for the duration of the challenge (Figure 3).

Despite minor fluctuations participants had an overall favorable experience with the challenge.

The evolving enjoyment levels reveal an initial mixed response in week 1, with 31% (n=4) describing it as "great", another 31% (n=4) as "good", 23% (n=3) as "so-so", and 15% (n=2) finding it "challenging". Importantly, no participant reported the challenge as going "terrible" for them during the entirety of the challenge. As the weeks progressed, most participants shifted from describing the challenge as "great" to an overall sentiment of "good."

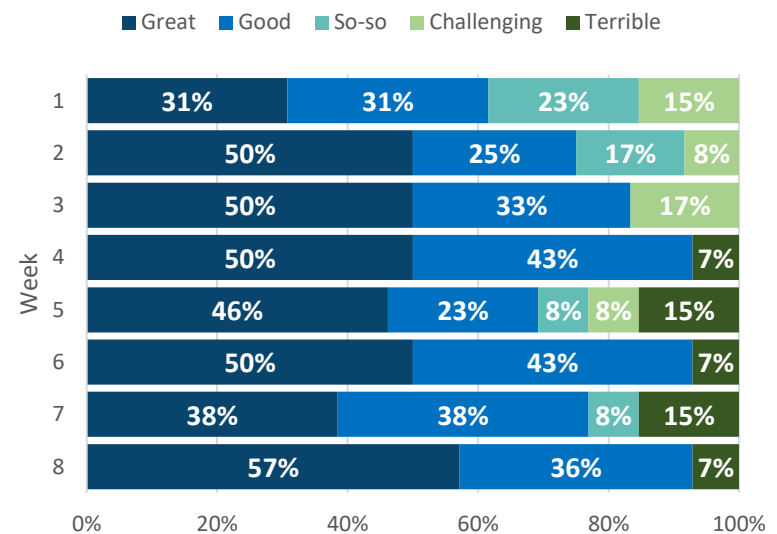


Figure 3. Majority of respondents rated the challenge as either great or good across 8 weeks (N=13)

Challenges and Rewards

Maintaining consistent sustainable habits stood out as the primary challenge encountered by participants.

Participants highlighted various challenges encountered during the sustainable living challenge. Over the eight weeks, about 28% (n=30) of the responses were dedicated to habit formation, involving efforts such as remembering to carry reusable items. In contrast, 25% (n=27) of the responses suggested that participants did not encounter any challenges in their sustainable activities. Twenty percent of participant responses (n=21) highlighted challenges in adapting to the demands of the activity, such as accounting for longer travel times or weather conditions. Additionally, 18% (n=19) cited challenges with decision-making and confidence in navigating their specific environmental activities. Lastly, 9% (n=10) highlighted the challenge of sourcing necessary resources, such as finding suitable biodegradable bags and specific sustainable products, to complete their environmental tasks.

Participants experienced increased environmental awareness and found the integration of eco-conscious choices into their lifestyle to be highly rewarding.

Participants found various aspects of the challenge rewarding. The most frequently mentioned aspect was the heightened environmental awareness and adoption of eco-conscious choices resulting from their engagement with the challenge, accounting for 36% (n=38) of responses. Following this, 29% (n=31) of responses indicated the formation of sustainable habits and lifestyle changes rewarding, while 22% (n=24) expressed satisfaction in witnessing consistent progress and improvements week by week. Additionally, 9% (n=10) of responses valued the flexibility to integrate creative environmental practices, and 3% (n=3) found reward in sharing sustainable values and engaging with the community. Only one reference across the eight weeks regarded the entire challenge as rewarding.

Pre- and Post- Survey Responses

Thirteen (13) out of 40 individuals who signed up for the challenge fully completed the challenge. Before and after completing the challenge, they completed a pre-and-post survey on their commitment, barriers, and knowledge on environmental sustainability. The post survey also asked participants to reflect on the challenge itself. The 27 individuals who signed up but did not finish the challenge were sent an exit survey to determine why they were unable to complete the challenge. The exit survey focused on perceived values or areas of improvement needed for the challenge to work. Six (6) out of 27 responded to the exit survey.

Contributing to society and the environment was a primary motivator for participating in the challenge.

Participants answered which factors motivated participation in the challenge through an open-ended question and answers were inductively coded (Figure 4). The most prominent response was to contribute to society/the environment, 54% (n=7). Financial incentives were not selected by participants. Other factors included the impact on the future and learning more about environmental sustainability. Most motivating factors were selected more in the post-survey than in the pre-survey, with the exception of money and miscellaneous responses.

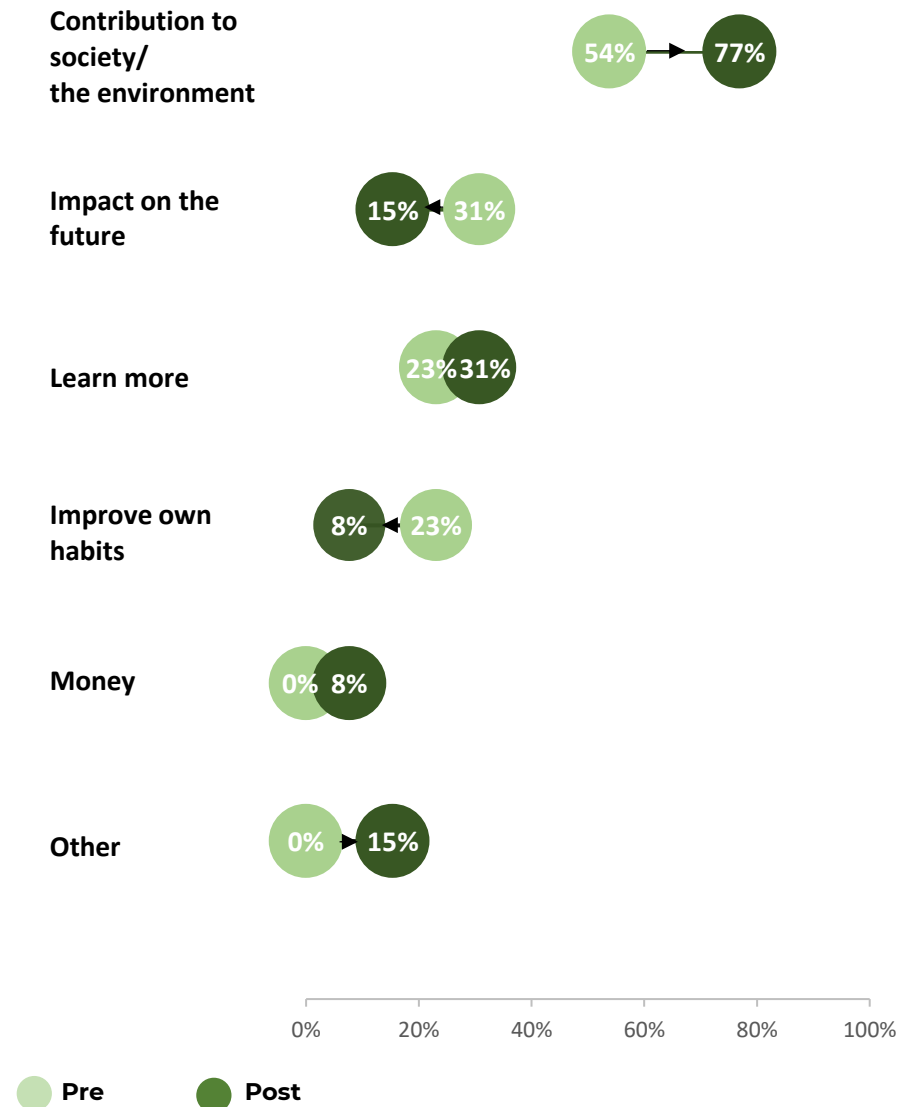


Figure 4. Contribution to society/the environment was the most selected reason for participation in the environmental challenge in both pre- and post-survey (N=13)

Barriers to adopting eco-friendly practices.

Participants were given a list of barriers that could prevent them from adopting or implementing eco-friendly practices as can be seen in [Appendix B Figure 1](#). Most selected factors that stopped respondents from adopting or implementing more eco-friendly practices were reduced after completing the challenge (N=13). In the pre-survey, most respondents, 62% (n=8) labeled *lack of knowledge or information* as a barrier. In the post-survey, lack of awareness was found to be the most common barrier at 43% (n=6), which remained unchanged from the initial survey. The barrier in the post-survey with the least amount of respondents, 15% (n=2) was *perceived inconvenience or inconvenience*.

Participants who didn't complete the challenge and completed the exit survey also listed the barriers that could prevent them from adopting or implementing eco-friendly practices ([Appendix B Figure 1010](#)). When compared to [Appendix B Figure 1](#), far fewer percent of respondents labeled any of the barriers as stopping them from adopting eco-friendly practices. Four out of the eight barriers saw no change in the pre-survey compared to the exit survey staying at either 33% (n=2) or 17% (n=1). Perceived inconvenience or inconvenience and lack of knowledge or information reduced by one by the exit survey. Uncertainty about the effectiveness

62% of participants cited *lack of knowledge* as a barrier to adopting or implementing eco-friendly practices.



and lack of time to research or implement changes increased by three by the time of the exit survey.

Conservation activities performed.

Participants were given a list of conservation activities and asked how often they were performed, using a five-point Likert scale. [Appendix B Figure 2](#) shows a dumbbell graph comparing pre- and post-survey responses. The three responses most often done by participants in the pre-survey were *donating unneeded used/old clothes*, 100% (n=13), *recycling*, 92% (n=12), and *using reusable water bottles*, 92% (n=12). The three conservation activities with the fewest participation in the pre-survey were *compost* 15% (n=2), *grow own food* 38% (n=5) and *volunteer in environmental activities* 46% (n=6). Eight out of eleven conservation activities were performed more after the challenge. Of those three moved up to 100% (n=13) participation. Two of the eleven saw no change, growing their own food and using reusable utensils outside the home. Only one out of the eleven responses, donate unneeded used/old clothes saw a decrease in participation in the post-survey, with a change from 100% (n=13) to 85% (n=11).

[Figure 5](#) shows photos participants took of their activities during the challenge.

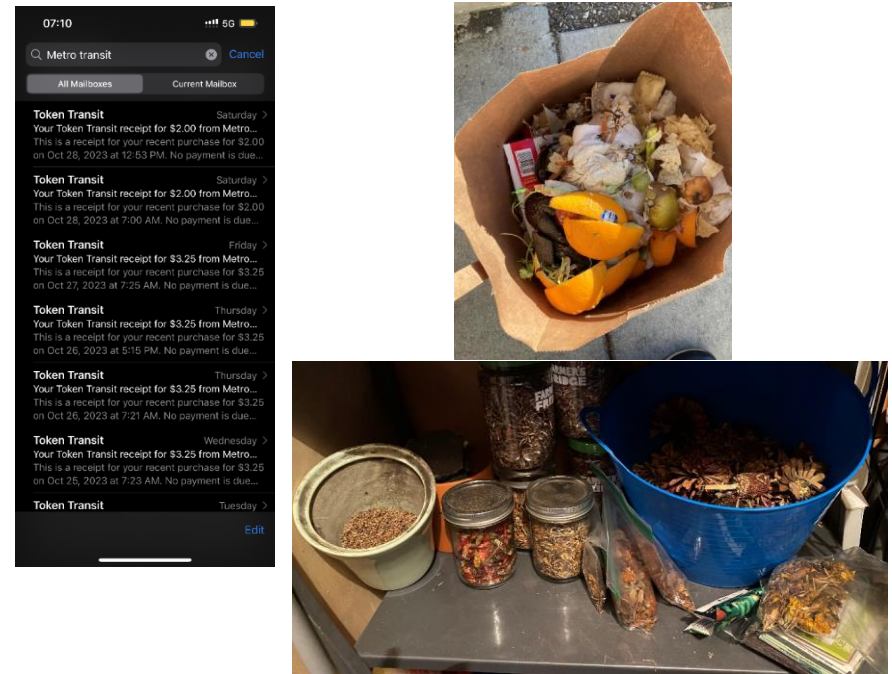


Figure 5. Sustainable activities performed. a. (left) using public transportation; b. (top) composting materials; c. (right bottom) canning.

Informed about environmental issues and sustainability.

Participants were asked to assess their level of awareness about environmental issues and sustainability through a Likert scale ([Appendix B Figure 3](#)). In the pre-survey, 54% (n=7) respondents felt informed about environmental issues more than sustainability practices at 15% (n=2). Awareness in both topics increased about 40% (n=5) by the post-survey.

Participants who filled exit survey without completing the challenge also gave their level of awareness about environmental issues ([Appendix B Figure 11](#)). Participants feeling informed about sustainability increased 33% (n=2) to 67% (n=4). A similar increase existed for participants feeling informed about environmental issues increased from 0% (n=0) to 33% (n=4).

Desire to change for the environment.

Participants were asked to assess their level of desire to change for the environment using a Likert scale ([Appendix B Figure 4](#)). In the pre-survey, 92% (n=12) of respondents felt willing to change habits to be more sustainable. Meanwhile, respondents' attitudes towards life effect on personal enhancement of sustainability started at 54% (n=7). Both variables increased in the post-survey by 8 (n=1) and 15 (n=2) percentage points, respectively.



There was a 40% increase in awareness of environmental issues among challenge participants.



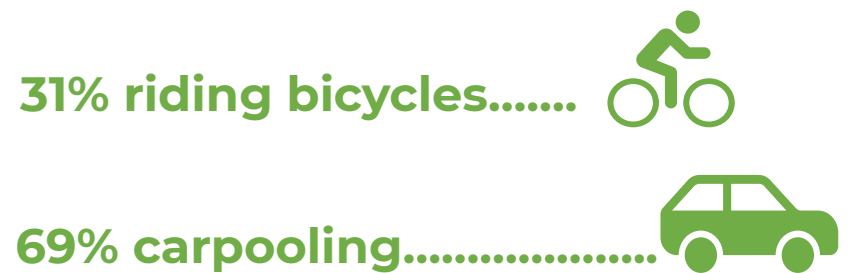
There was a 33% increase in awareness of environmental issues among those that did not complete the challenge.

Participants who completed the exit survey without completing the challenge also expressed their level of desire to change habits to protect the environment ([Appendix B Figure 12](#)). In the pre-survey, 100% (n=6) of respondents felt willing to change their habits to be more sustainable. Those 100% (n=6) of respondents also agreed that their attitude towards life contributes to their commitment to the enhancement of sustainability.

The exit survey showed that respondents' willingness to change habits to be more sustainable stayed the same at 100% (n=6). Meanwhile respondents' agreement that their attitude towards life contributes to their commitment to the enhancement of sustainability dropped by 50% (n=3)

Regular sustainability activities.

Participants were asked about the frequency with which they performed certain sustainability practices ([Appendix B Figure 5](#)). The percentage of responses for *riding a bicycle in place of a car* (31%) and *carpooling* more than once a month (69%) stayed consistent between surveys. *Recycling* more than once a month increased from a low of 31% in the pre-survey to a high of 69% in the post-survey.



Reflection of challenge by those that completed it.

The post-survey gave respondents the opportunity to share their individual reflections on the challenge. As seen in [Figure 6](#), all respondents rated the overall experience of participating in the sustainable living challenge positively with 38% (n=5) rating it as 'good' and 62% (n=8) as 'excellent'. As seen in [Figure 7](#), most respondents agreed {46% (n=6) agreed and 31%(n=4) strongly agreed} that the sustainable living challenge provided the necessary resources and information to adopt sustainable practices effectively. Only 15% (n=2) disagreed. As seen in [Appendix B Figure 7](#) all respondents agreed that they were successful in implementing sustainable practices during and after the challenge. 62% (n=8) of respondents strongly agreed with being slightly more successful in implementing sustainable practices during which is 54% (n=7) more than after the challenge.

As seen in [Appendix B Figure 6](#), 85% (n=11) respondents agreed that the sustainable living challenge increased knowledge and 77% (n=10) awareness of environmental issues and sustainability practices. Only 8% (n=1) disagreed across both variables.

As seen in [Figure 8](#), most respondents agreed that sustainable living had a positive impact in forming habits and

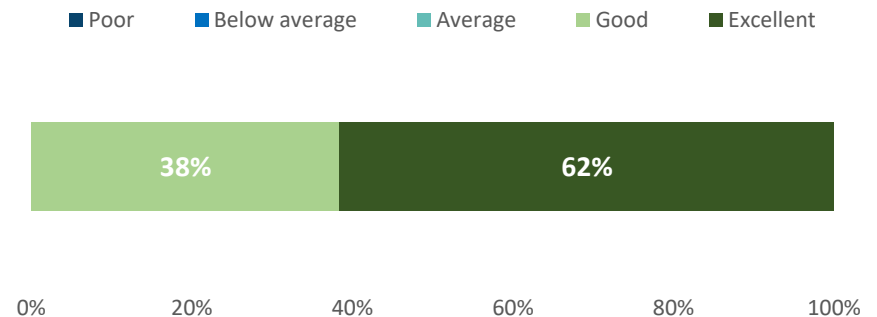


Figure 6. Participants rated overall experience participating in the sustainable living challenge good and excellent (N=13)

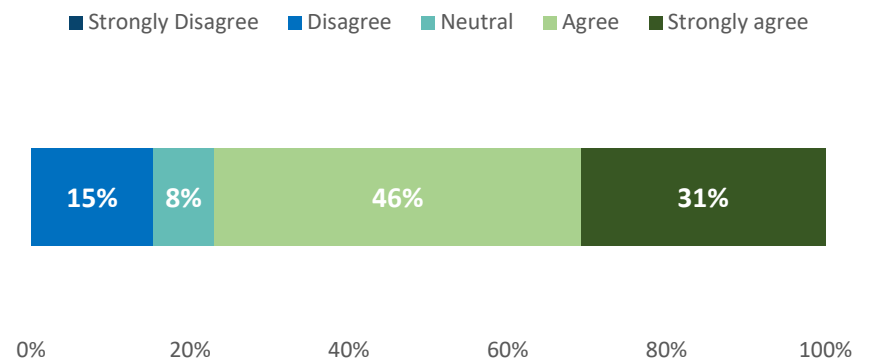


Figure 7. Sustainable living challenge provided the necessary resources and information to adopt sustainable practices effectively (N=13)

increasing/gaining knowledge related to environment protection and sustainability practices. Only 8% (n=1) disagreed with this statement. A majority 85% (n=11) of respondents agreed that all three variables – habits, knowledge and empowerment – increased as a result of participating in the sustainable living challenge. Slightly more 38%(n=5) respondents strongly agreed that they felt empowered compared to 31%(n=4) knowledgeable and committed to daily habits.

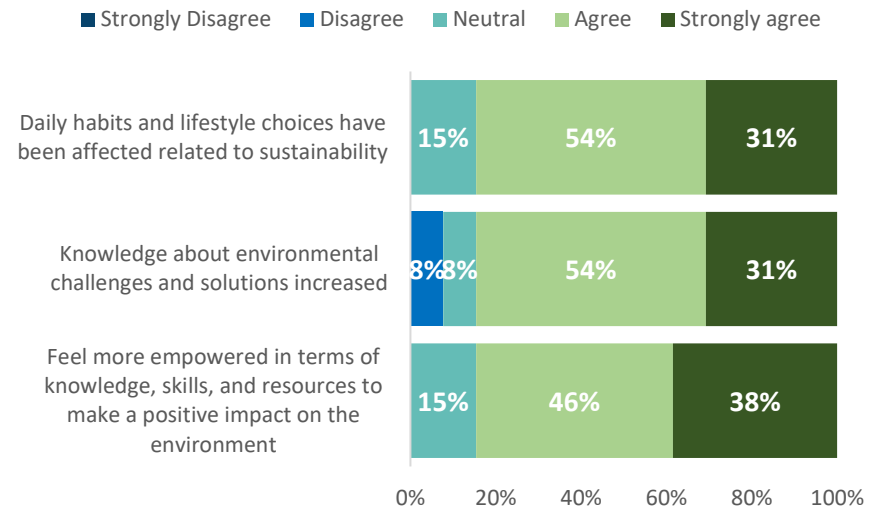


Figure 8. Most participants agree that the sustainable living challenge increased habits, knowledge and feeling of empowerment on sustainability (N=13)

Reflections on the challenge by those that did not complete it.

As with the post-survey, respondents who did not finish the challenge but completed the exit survey were asked for individual reflections on the challenge. The perceived level of difficulty was split down the middle with 50% (n=3) viewing it as challenging and 50% (n=3) as neutral or not challenging.

Respondents of the exit survey were asked if the environmental challenge provided them with the knowledge and resources to make changes in the future. As seen in [Figure 9](#), 100% (n=6) of respondents agreed that the environmental challenge influenced their knowledge of sustainable practices and provided the necessary resources to adopt practices efficiently. The 67% (n=5) majority of respondents felt that the environmental challenge increased awareness of environmental issues and the importance of sustainable practices while the rest 33% (n=2) responded neutral.

Respondents of the exit survey were asked if they felt successful in implementing sustainable practices and empowered to make a positive environmental impact. As seen in [Figure 10](#). Most participants who did not complete the challenge led them to feel more empowered and

67% (n=5) of respondents felt successful in implementing sustainable practices during and after the challenge while the rest 33% (n=2) responded neutral. All six respondents agreed to feeling empowered to make a positive environmental impact.

When asked for any additional comments or suggestions regarding experience with the environmental challenge respondents mentioned they would like more knowledge and information about sustainability practices and expressed regret for not completing the challenge.

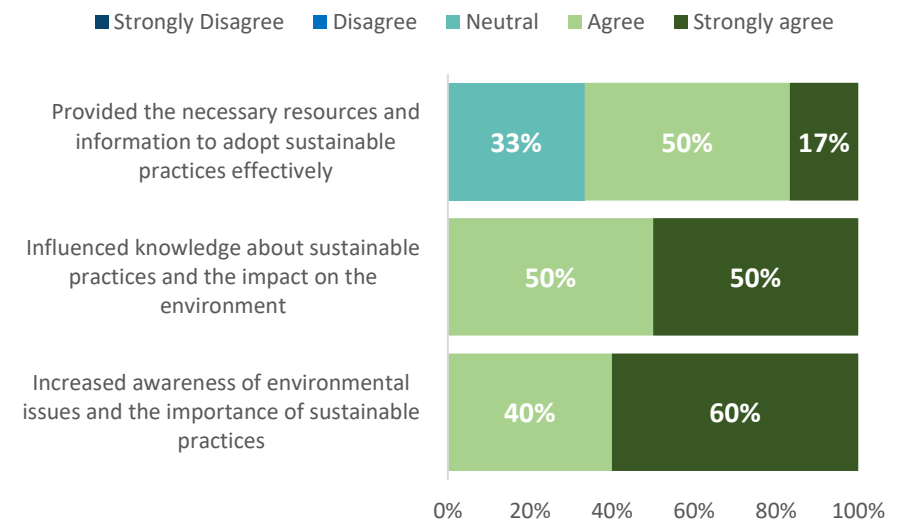


Figure 9. Most participants who did not complete challenge still viewed the sustainable living challenge as having provided necessary resources and expanded knowledge and awareness on environmental issues (N=6)

When asked what barriers hindered them from completing the sustainability living challenge, 33% (n=2) respondents listed at the same rate lack of instructions of the challenge, technical issues, and family responsibilities. Lack of time was another factor selected.

When asked which sustainable living habits should have been emphasized more, half (n=3) of respondents selected waste reduction. Water conservation and recycling were also chosen just to lesser extent.

Additionally, a 67%(n=5) majority of respondents expressed interest in participating in environmental challenges or similar initiatives in the future.

When asked what support or motivation could be better provided to help complete the challenge successfully, respondents answered more time, less notifications, and assistance with composting particularly during the winter.

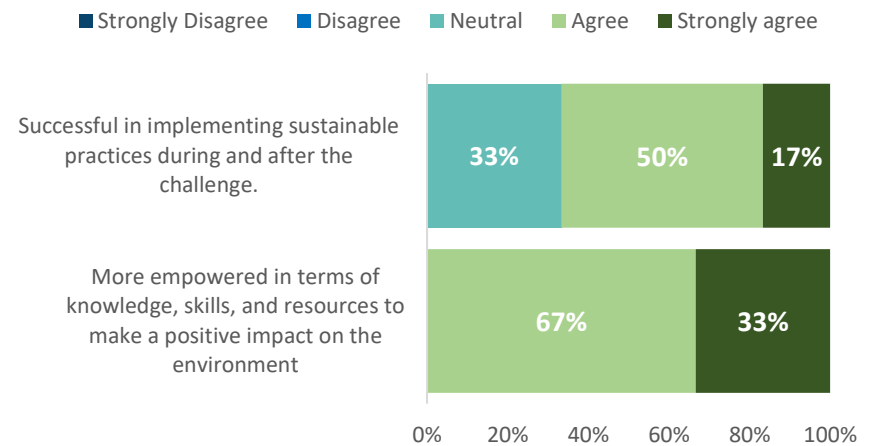


Figure 10. Most participants who did not complete the challenge feel that the challenge led them to feel more empowered and successful in sustainability (N=6)

Discussion

Interest of the Latino community in environmental sustainability actions.

Latinos in the Twin Cities and Mankato areas showed strong interest in environmental sustainability throughout this study. Design sessions, workshops, and the final challenge **revealed deep concern about climate change and institutional barriers**. Participants also described how immigration shaped their perspectives. Prior conservation practices from their home countries, often differing from US resources and commercialization, informed their adaptation strategies.

Growing evidence points to a deep and dedicated concern for the environment within the Latino community. A recent study by the Program on Climate Change Communication (Ballew, et al, 2020) revealed a powerful trend: diverse ethnic groups, particularly People of Color, often express strong environmental values. Among survey participants, Latinos, along with Black Americans, stood out for their willingness to act, urging elected officials to collaborate on mitigating climate change.

The study further underlines the significant investment Latinos demonstrate towards addressing the challenges of climate change. This dedication stems from a lived understanding of the issue's impact. Many Latino communities reside in regions particularly vulnerable to environmental shifts, experiencing firsthand the consequences of rising sea levels, extreme weather events, and altered ecosystems.

This concern translates into action. From grassroots organizing to advocating for climate-friendly policies, the Latino community plays a crucial role in the environmental movement. Their leadership offers unique perspectives and invaluable insights, enriching the fight for a more sustainable future for all.

Sustainability actions already done by Latino communities.

Based on responses from the challenge participants, **Latinos in the Twin Cities and Mankato metro area are more likely to already be engaged in recycling, reusing materials and reducing water consumption.**

At the same time they are less likely to be engaged in composting, gardening, volunteer activities, and using alternative means of transportation. While there were some complaints about the recycling infrastructure, there were existing useful recycling resources accessible in Minnesota. The primary barriers listed that prevented Latino populations in Twin Cities and Mankato from engaging in alternative means of transportation, composting, gardening, and volunteering were lack of knowledge and accessible resources.

A study on urban home gardens in the Global North (Taylor, J. R., & Lovell, S. T. 2014) support that there is a growing interest in urban gardening by households of Mexican origin as well as African Americans, and those of Chinese. The study highlights “the urban agrobiodiversity with roots in the Global South”. While interest in gardening is high, knowledge gaps in safe practices hinder its adoption among these communities. Targeted outreach and research are needed to bridge this gap and offer support.

A possible reason that participants did not engage in alternative transportation was issues with public transportation access by Populations of Color. A 2021 spatial demography study (Anderson, K. F., & Galaskiewicz, J. 2021) found that public transportation in Black and Latino neighborhoods provided less access to jobs compared to white neighborhoods and aggravate existing inequalities.

The challenge led to further exploration.

Participants who either completed the challenge or didn't but answered an exit survey agree for the most part that participating in the challenge and the workshops were successful in motivating them to continue sustainable actions and informing them about environmental issues they were concerned about. The challenge also **helped them connect with their local communities and build stronger familial bonds.**

To what degree the challenge and similar pursuits will maintain interest in sustainable living and learning in the longer term will still need to be studied. A more in-depth study (Cordero, Et al, 2020) on graduate student behavior after taking a one-year environmental university course saw a commitment to sustainability and a smaller eco-footprint after five years. The study supported that a structured commitment to learning about sustainability can lead to long-term commitments.

Desire to focus environmental education in new generations.

Across the design sessions and the challenge, **participants highlight the role that younger generations will have in environmental sustainability. They express worry for what they are leaving their children to face.** The Participants believe that the best strategy to make an environmentally just future is to empower the new generation with the knowledge and resources they lacked growing up.

The role of fostering the new generation to face is explored in many studies, and the 2021 journal Children's Geographies (Walker, 2020) holds many findings on the expectations and experiences of those new generations. One of the articles of the journal 'Generation Z' and 'second generation' explores the unique expectations of second-generation immigrant have in confronting the climate crisis.

Limitations

Low participation.

Both the design session and the sustainable living workshop were limited by small participation rates. This lack of participation could have occurred due to a variety of factors. One factor that limited participation was the difficulty in outreach efforts to sign up Latinos for either the workshop or the design session. Even when outreach was successful and members of the Latino community were willing to participate in the design session and the sustainable living workshop it was difficult to coordinate times that worked for everyone who signed up given the difference in personal schedules. On multiple occasions, participants who signed up were unable to make it to the time they signed up for.

Sustainable living workshops resources.

More participants were able to attend virtual workshops when compared to the in-person workshop. However, the virtual workshop was limited in its ability to provide physical resources when compared to the in-person workshop. Both workshops were highly dependent on the content and resources experts brought with them. Many great organizations and experts that had wonderful resources lacked Spanish resources and were hesitant to present having to depend on translation services.

Sustainable living challenge completion rate.

Unlike with the difficulty in signing up sufficient participation in the design session and the sustainable living workshop, the goal of 40 Latino participants signed up for the sustainable living challenge was achieved. However, despite obtaining the desired sign up, full completion of the challenge was difficult to obtain. Only 13 out of the original 40, less than a third, completed the pre-survey, the tacking form, and the post-survey. This small rate of completion limits any of the impact that this sustainable living challenge had on participants, the community, and future environmental change efforts. Additionally future attempts at sustainable challenges must consider the weather by either taking place in a warmer time frame or presenting alternative practices for colder weather.

Furthermore, the limited participation (less than a quarter) in the exit survey by those who did not complete the sustainable living challenge restricts our ability to draw meaningful conclusions about the factors preventing challenge completion.

Biased response.

While the challenge demonstrated that Latinos in the Twin Cities and Mankato metro area are interested in supporting the environment, merely participating in any part of the project could be due to pre-existing interest in the environment that is not reflective of the whole Minnesotan Latino community. Additionally,

the findings of this study concentrate on metro areas and thus do not take into account environmental concerns or activities done by rural Latinos in MN.

Minnesota's seasonal weather provided barriers to sustainability commitments.

The time frame of the challenge provided unexpected difficulties regarding committing to sustainable practices. While participants were very motivated to engage at the beginning of the challenge, Minnesota's seasonal weather provided barriers that should be addressed in future attempts at similar challenges. For participants who engaged in reducing car use Minnesota winters or cold late autumns made conditions difficult to walk, use public transportation due to slippery and cracked sidewalks. Season change also produced cold hard dirt affecting composting and gardening.

Recommendations

Based on the findings and insights gained from environmental engagement within the Latino community in Minnesota in this project, the following recommendations are proposed:

1 ***Diversified engagement strategies***

Collaborate with local organizations or community leaders to promote sustainable living, leveraging community networks for broader outreach and engagement. Showcasing the impactful and rewarding aspects of sustainable lifestyle changes in promotional materials can encourage wider community involvement in similar initiatives.

2 ***Culturally sensitive educational strategies***

Educational strategies should include culturally and linguistically accessible materials for participants. Ensuring broad community engagement through participatory action will help the Latino community to accrue knowledge and empower their decision-making regarding their sustainable habits and promote it within their social circles.

3 ***Increase availability of environmentally friendly resources***

Local and state programs should ensure the accessibility of essential materials, such as high-quality compostable bags and glass storage containers. These readily available resources will facilitate community participation in environmentally friendly practices, fostering engagement in sustainable habits among community members.

4 ***Enhance Latino community participation***

Encourage increased participation and representation of Latino voices in city planning and environmental decision-making processes. This could involve community forums, advisory groups,

or committees that specifically involve Latino representation to ensure diverse perspectives. Advocate for language inclusivity in environmental programs and policies.

Conclusion

This study illustrates the effectiveness of engaging the Latino community in Minnesota through educational programs and participatory actions, resulting in a heightened interest in sustainability. Despite encountered challenges, participants' commitment to sustainable living underscores a strong desire for change within the community. This emphasizes the potential for positive transformation when inclusive strategies and adequate resources are made available. Tailoring programs to accommodate diverse participant needs, including the provision of language-appropriate materials, presents a clear opportunity to cultivate more impactful and inclusive environmental initiatives. Therefore, collaborative efforts such as this hold the promise of significant progress toward environmental consciousness and equity across communities.

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Appendices

Appendix A Table 1

Group Design Sessions - Structure	
Planning	<p>Three design sessions were planned to be held in the Twin Cities metro area and 2 in Southern Minnesota. Each session was designed to host 6-8 participants divided into 2 groups and last approximately 90 min. Each group was given three questions which they had to respond to by drawing or collage. Participants were given drawing materials, magazines, scissors, and glue.</p>
Implementation	<p>All focus groups followed a structured format, beginning with individual reflections on personal experiences and perceptions of a healthy environment. Participants then engaged in peer-sharing, fostering trust, and providing an opportunity to comfortably share personal experiences.</p> <p>The "draw and tell" method was employed, dividing participants into large groups to design their ideal communities through drawings or magazine cut-outs. This was followed by a discussion and a collective reflection on their ideal communities and the application of their learnings to daily life. Notes were taken by the facilitators throughout the session</p>
Analysis	<p>The different themes and topics covered by the participants in each session were categorized in a word table. Themes from the design sessions were later compared and contrasted for common areas of environmental justice that interested the Latino community.</p>

Sustainable living workshops - Structure

Planning

The top five most frequent themes expressed during the design sessions were chosen to develop the educational interventions. Three workshops were planned to be held both in-person and virtually with experts in the areas of interest offering their experience and advice on sustainable living practices.

Implementation

During the workshops, the audience was encouraged to be more environmentally sustainable by expanding their knowledge of environmental issues and teaching them how to adopt sustainable practices. A list of resources and materials was made available in person and online. No analysis took place in this phase.

Sustainable living challenge - Structure

Planning

Researchers set up an 8-week sustainable living challenge with the goal of recruiting 40 participants. Participants had to be Latino adults living in either the twin cities or Mankato metro areas. Participants were asked to fill out a pre-and post-survey survey to assess change in knowledge and level of commitment to the environment. Participants who did not complete the challenge were asked to do an exit survey focused on barriers to finalizing their activity. Participants who successfully completed the challenge would receive a \$100 gift card. See challenge completion criteria in the figure below.

Implementation

Based on the findings from the design sessions, the top four sustainable living activities – Recycling, Reducing Disposable Waste, Composting/Food Waste Reduction, Sustainable Transportation Methods. – were selected as the main options for the challenge. Participants were asked to choose one sustainable living activity from the list and commit to it for the length of the challenge. Throughout the duration of the contest participants were required to report and reflect on their progress, successes, and challenges on a weekly tracking form.

Analysis

Answers from the pre- and post-surveys were compared to measure for change in knowledge, habits, and level of commitment to the environment. Answers collected through the pre-, post-, exit-, and tracking surveys, were tabulated, coded, and screened for themes, and represented graphically.

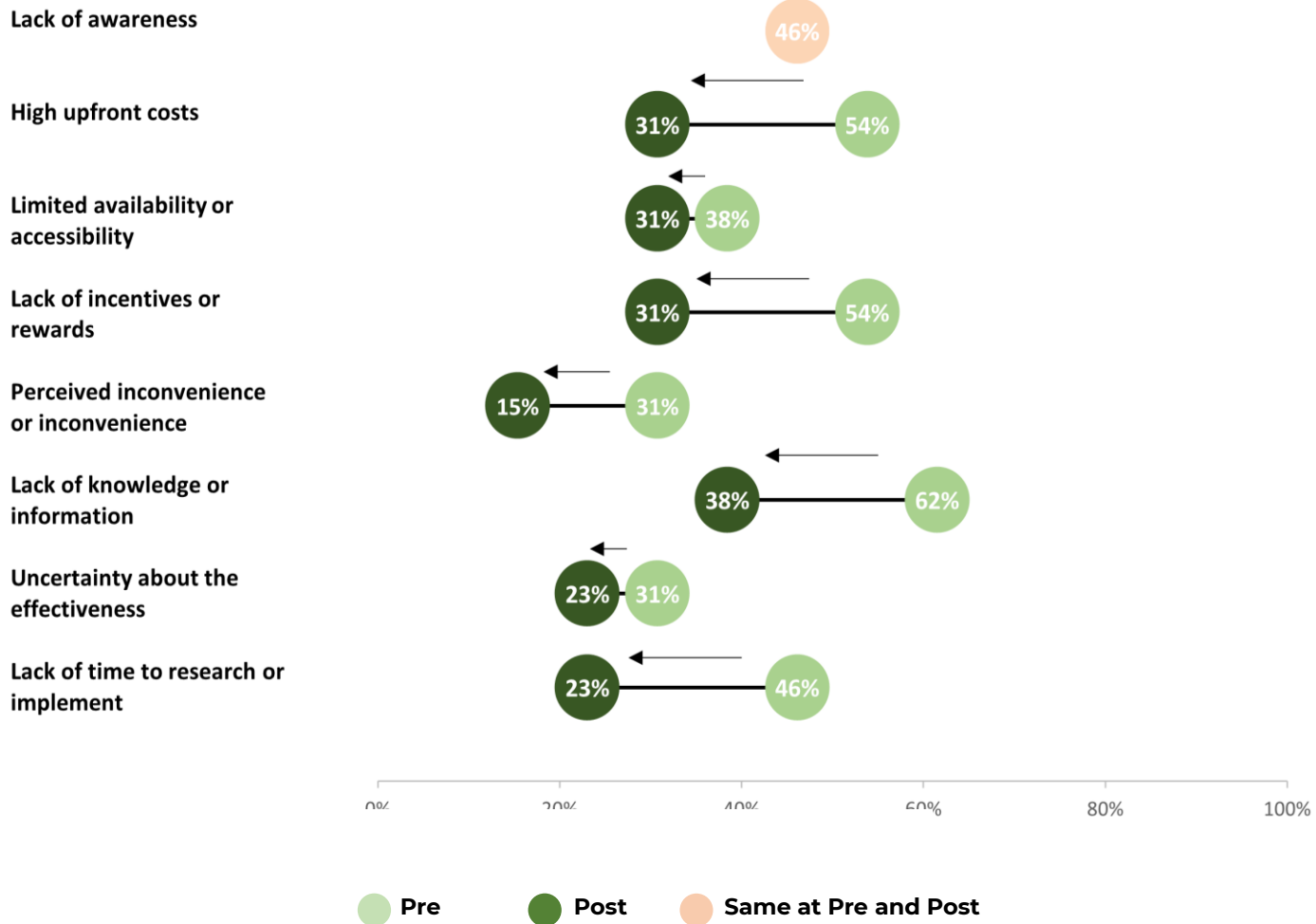
→ Challenge Completion Criteria

- Each week, you'll receive a reminder to complete a tracking form via text, call or email.
- The tracking form will ask questions about the environmental activity you chose, and your experience during that week. **It is very important that you describe how you engaged with your environmental activity to help us understand your progress.**
- Tracking forms are **due every Sunday** in this link: <https://tinyurl.com/HACER-Tracking-Form>.
- By the end of the challenge, you will have submitted a **total of 8 tracking forms**.
- You are required to **attach one photo** to at least **5 of the tracking forms** you submit.
- You are required to **attach one 30 second video** to at least **one of the tracking forms** you submit.
- To complete the challenge, you must also ensure the submission of both the pre and post surveys.

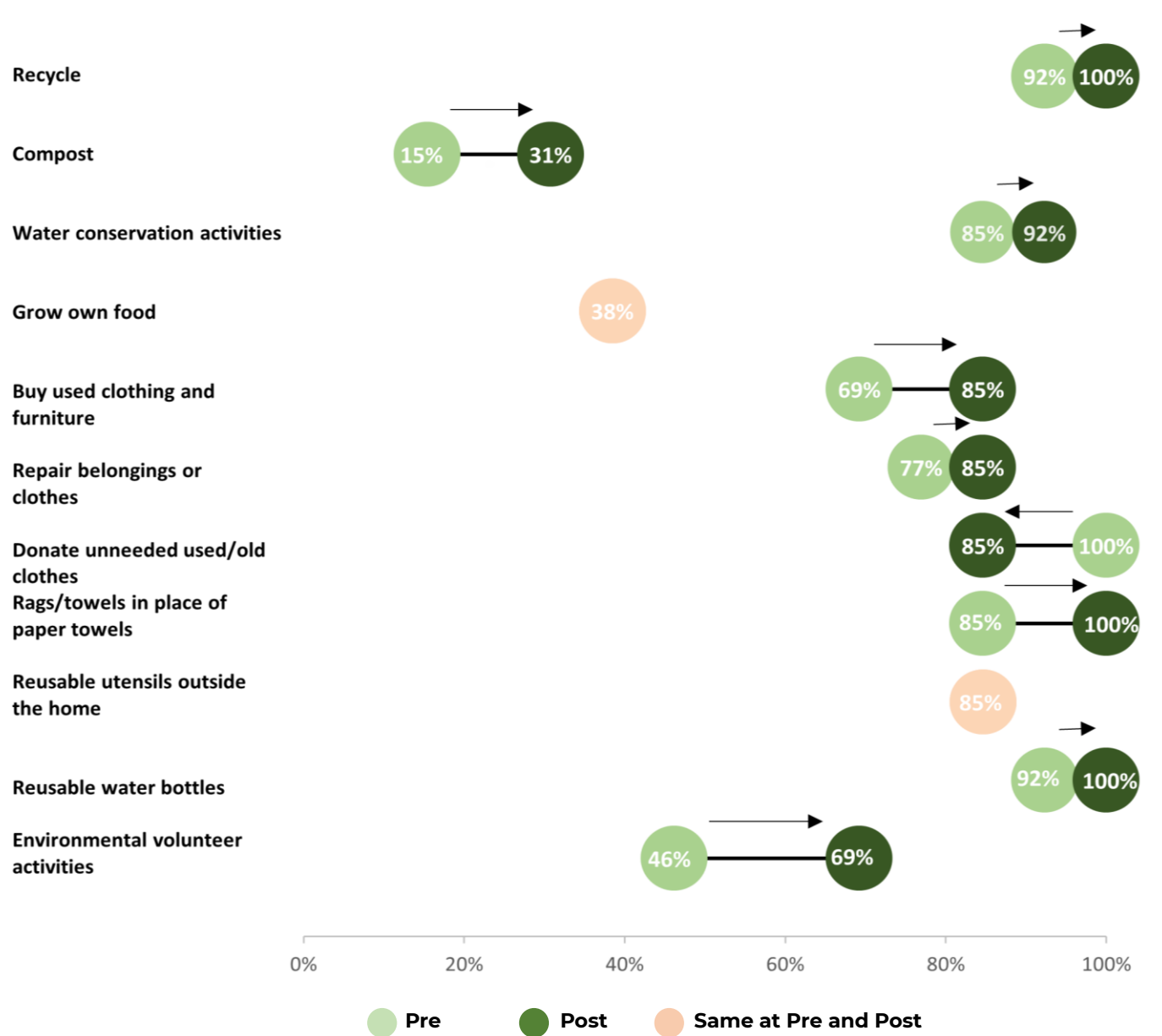
Appendix A Figure 1. Environmental challenge criteria

Appendix B

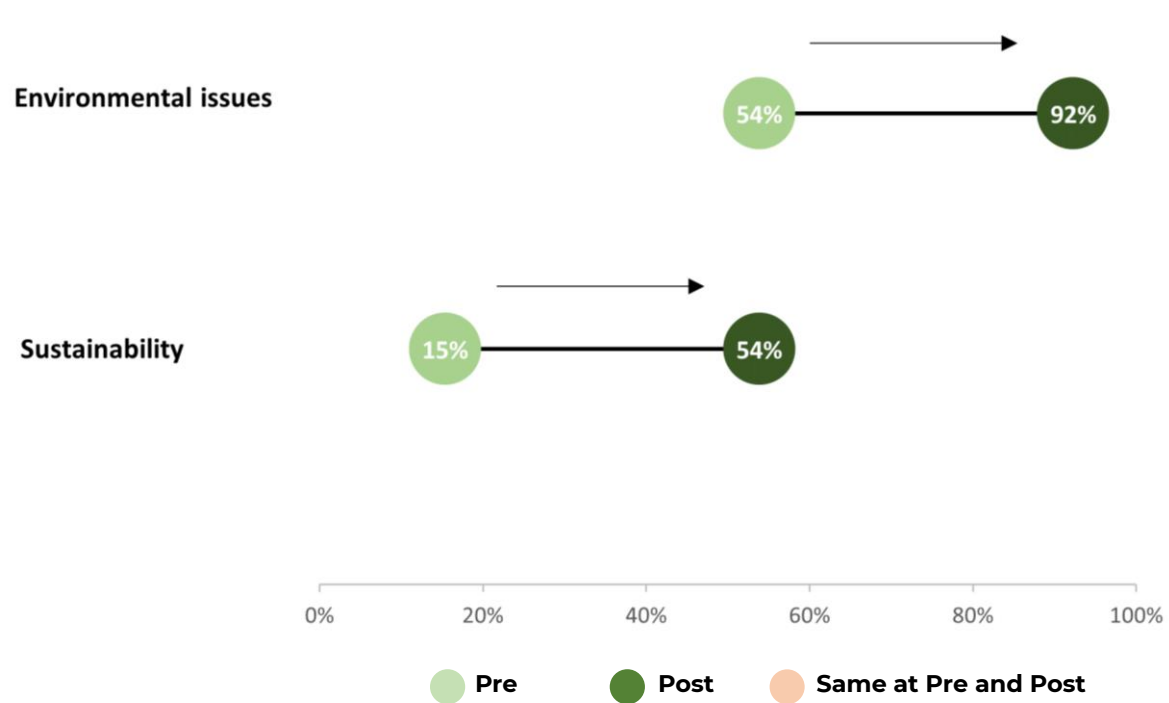
Pre/Post-survey results



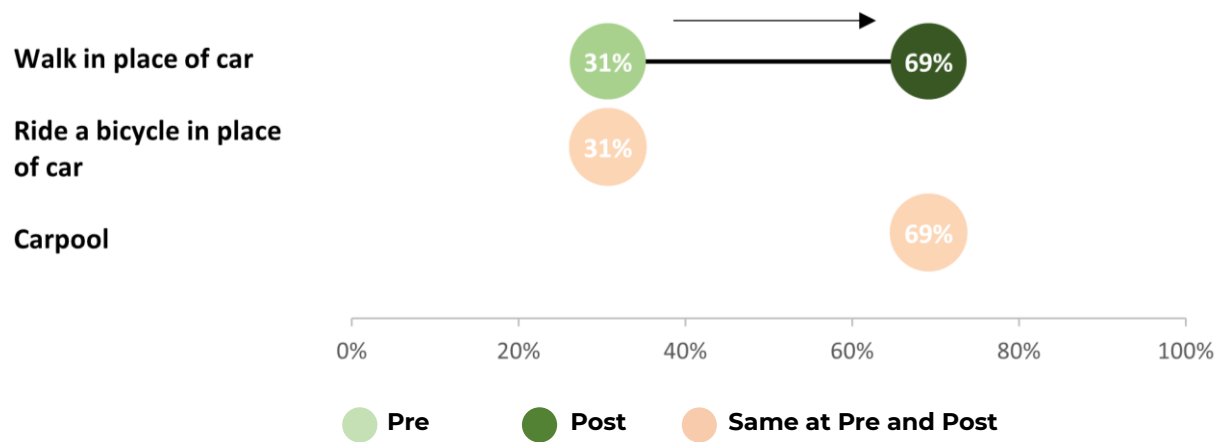
Appendix B Figure 1. Most selected factors that stopped respondents from adopting or implementing more eco-friendly practices were reduced after completing the challenge (N=13).



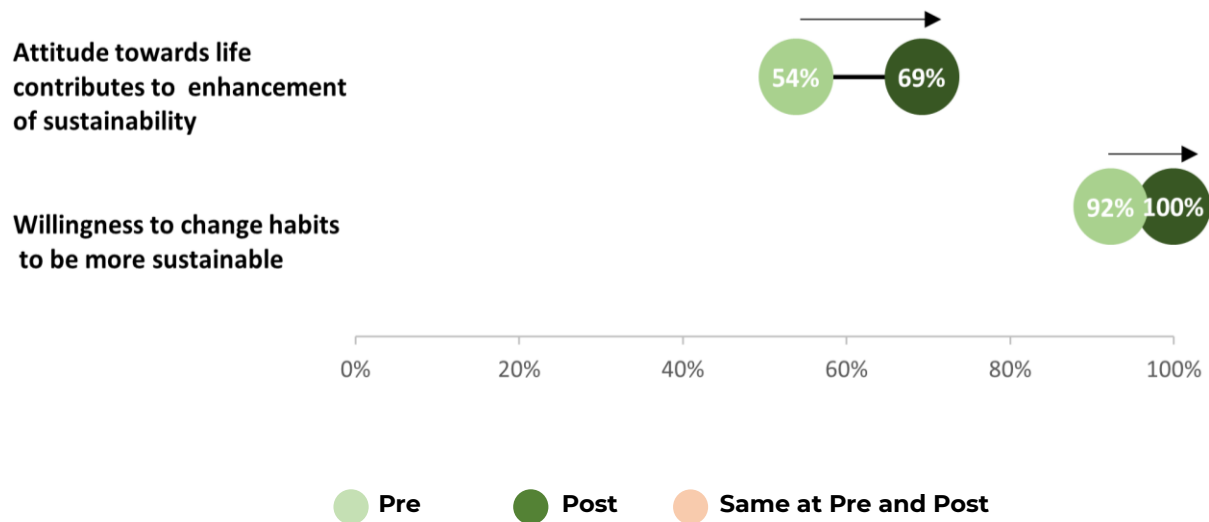
Appendix B Figure 2. Most conservation activities performed increased after the challenge (N=13).



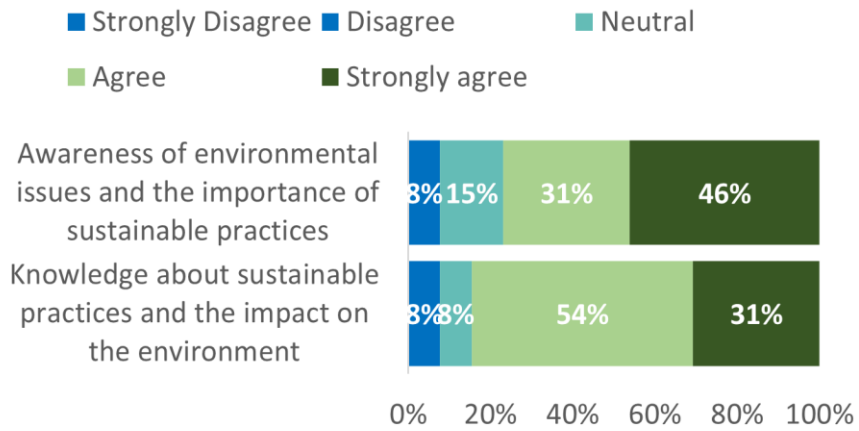
Appendix B Figure 3. More participants felt more informed about environmental issues and sustainability after the challenge (N=13).



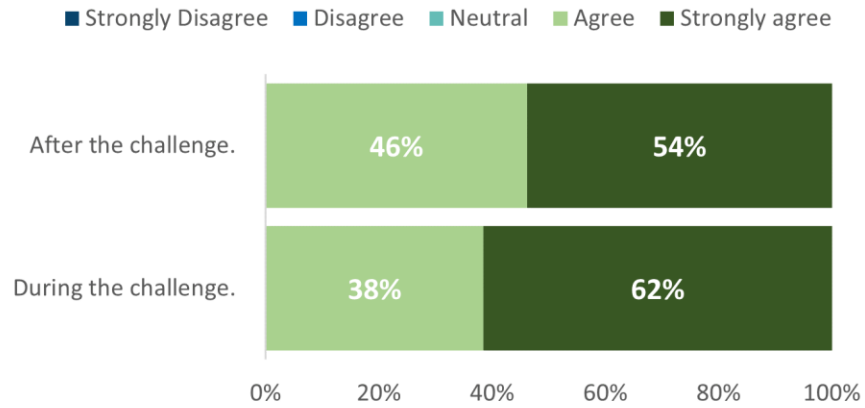
Appendix B Figure 5. More participants walk in place of driving more than once per month after challenge while bike riding and carpooling remained the same (N=13)



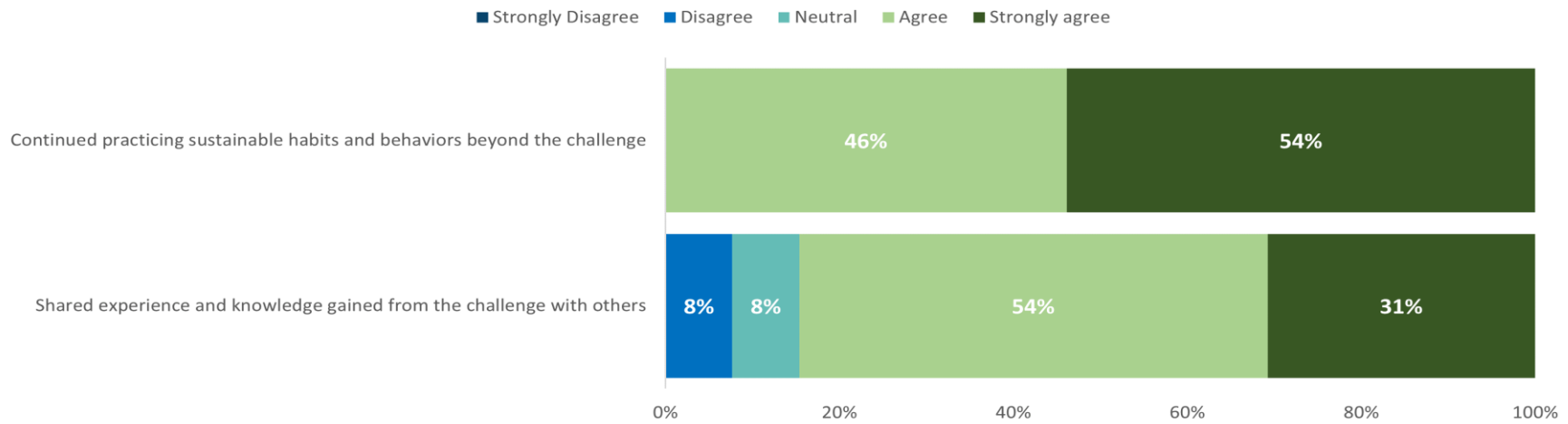
Appendix B Figure 4. More participants agreed that their attitude in life contributed to enhancing environmental sustainability and were more willing to change their habits to more sustainable ones after the challenge (N=13).



Appendix B Figure 6. Increased awareness of and knowledge about sustainable practices (N=13).

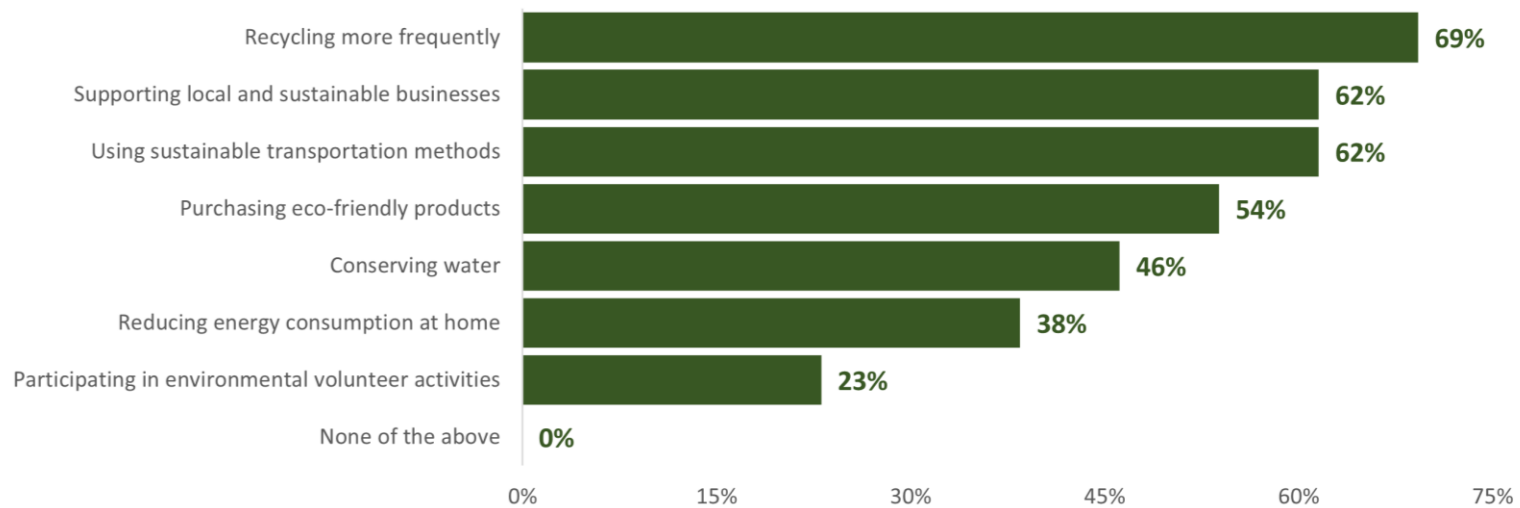


Appendix B Figure 7. Participants agree that they were successful in implementing sustainable practices during and after the challenge (N=13).

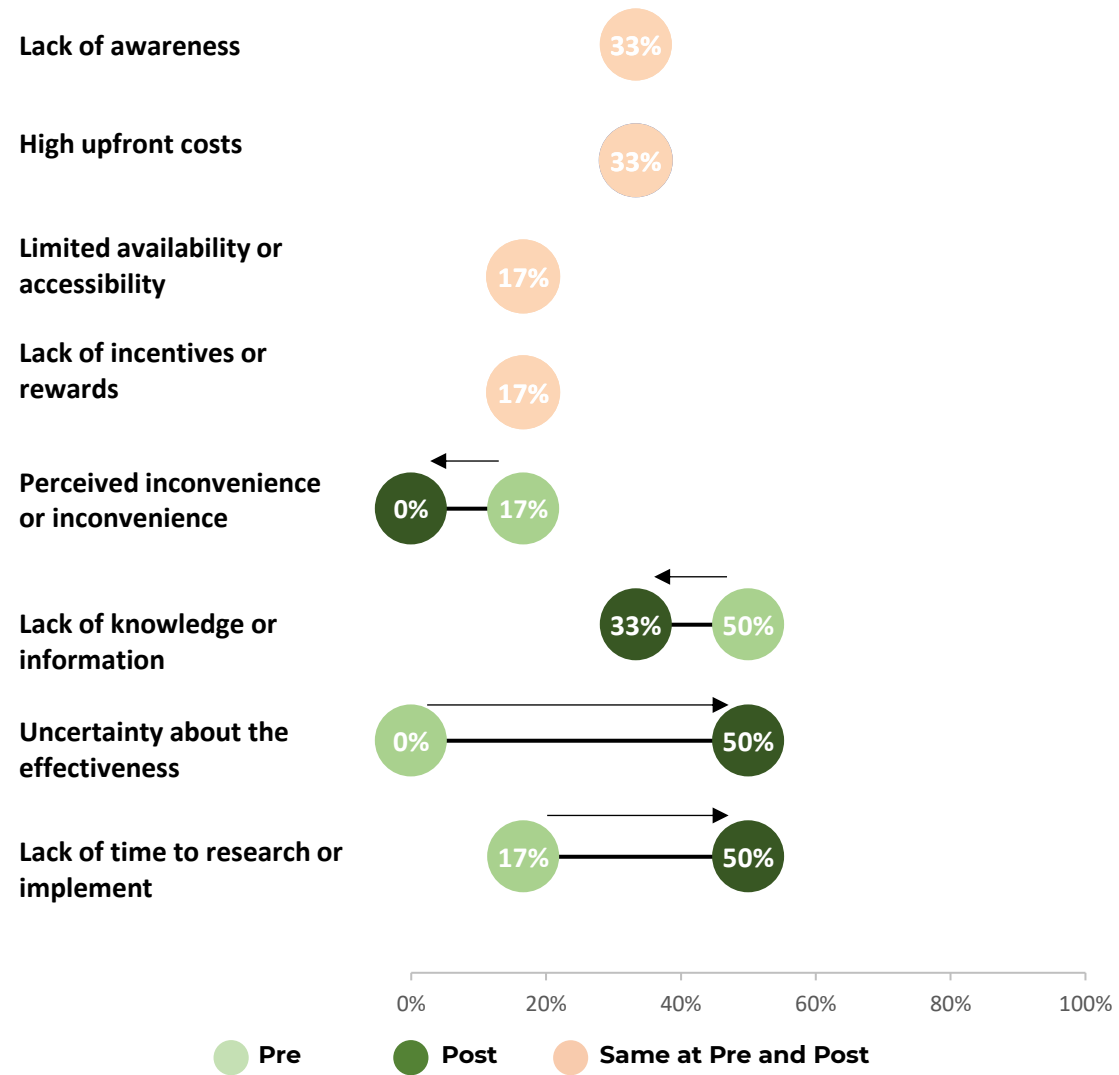


Appendix B Figure 8. Most participants agree that after the sustainable living challenge they continue practicing and sharing experiences of environmental sustainability (N=13).

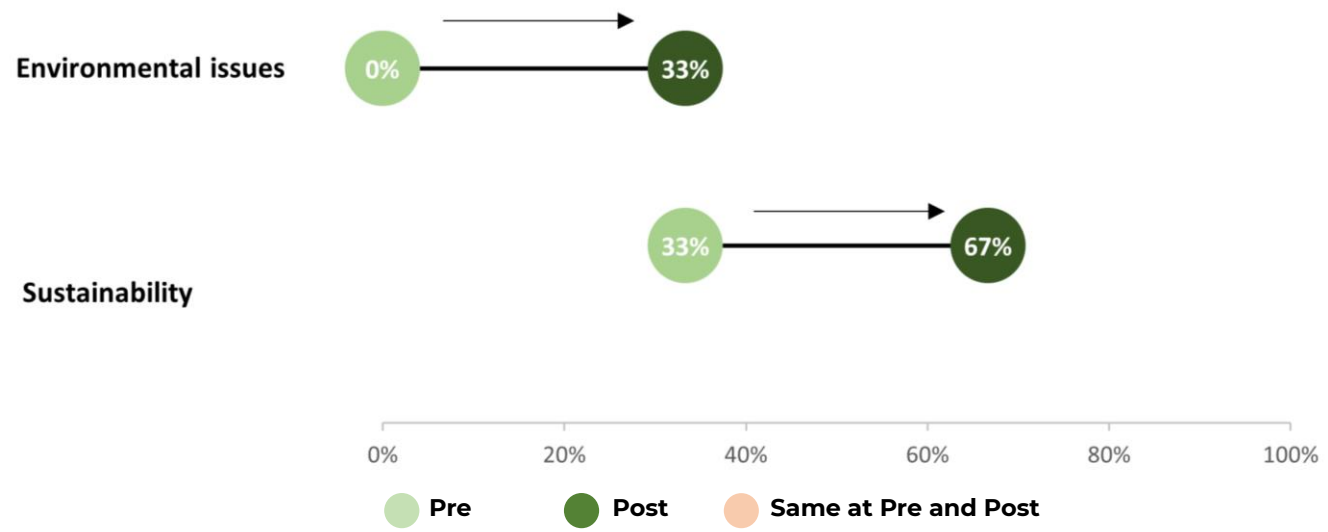
Exit Survey Results – Respondents who did not complete the challenge



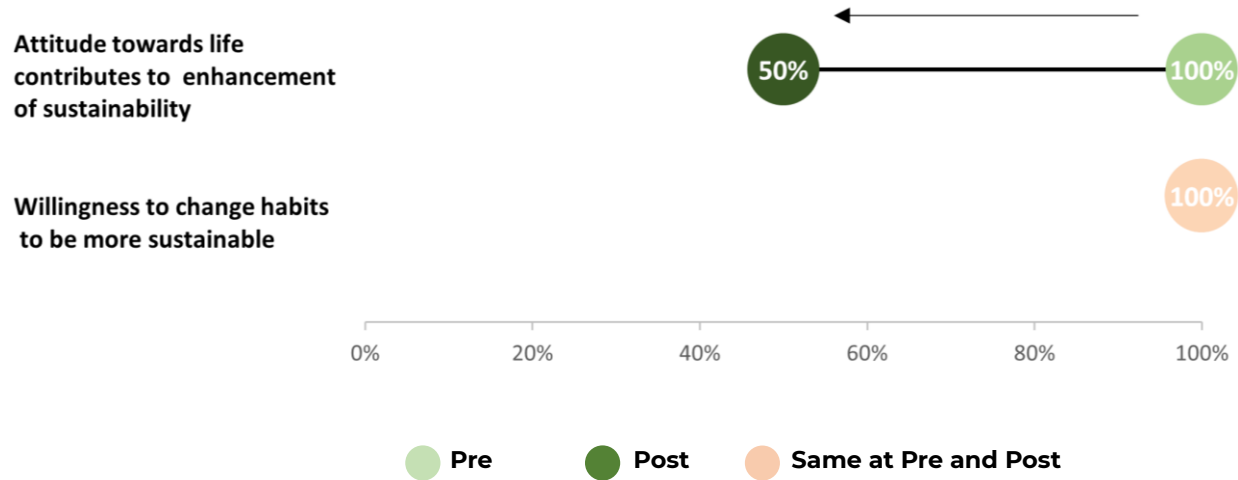
Appendix B Figure 9. Most respondents adopted recycling, supporting sustainable businesses, and using alternative transportation methods as a result of participating in the challenge (N=13).



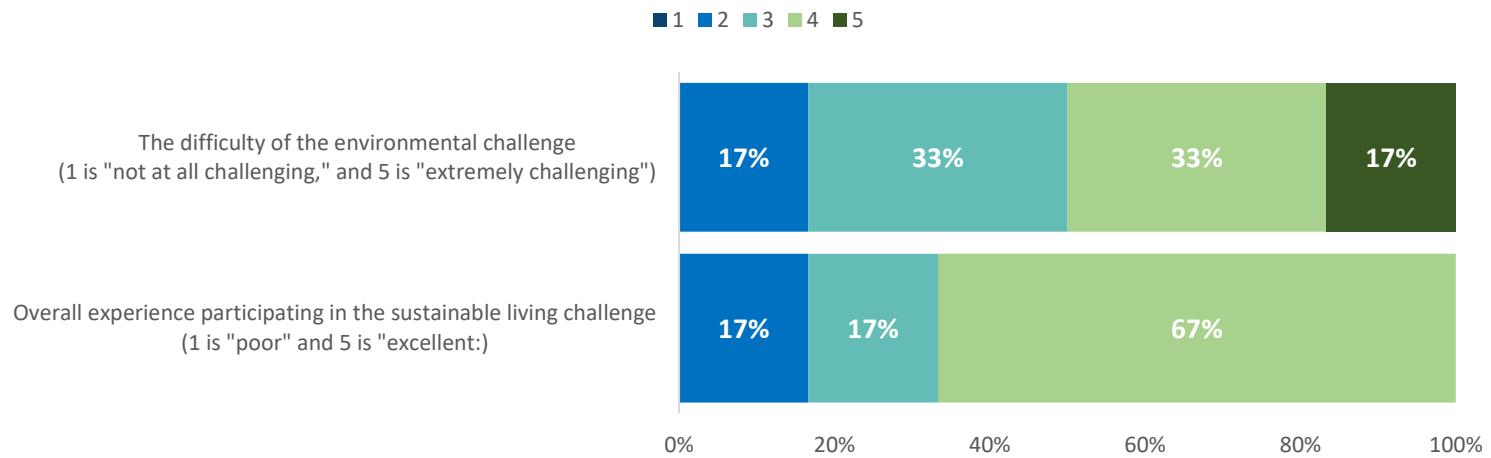
Appendix B Figure 10. Most factors that stopped respondents from adopting or implementing more eco-friendly practices were not selected by those who did not finish the challenge (N=6).



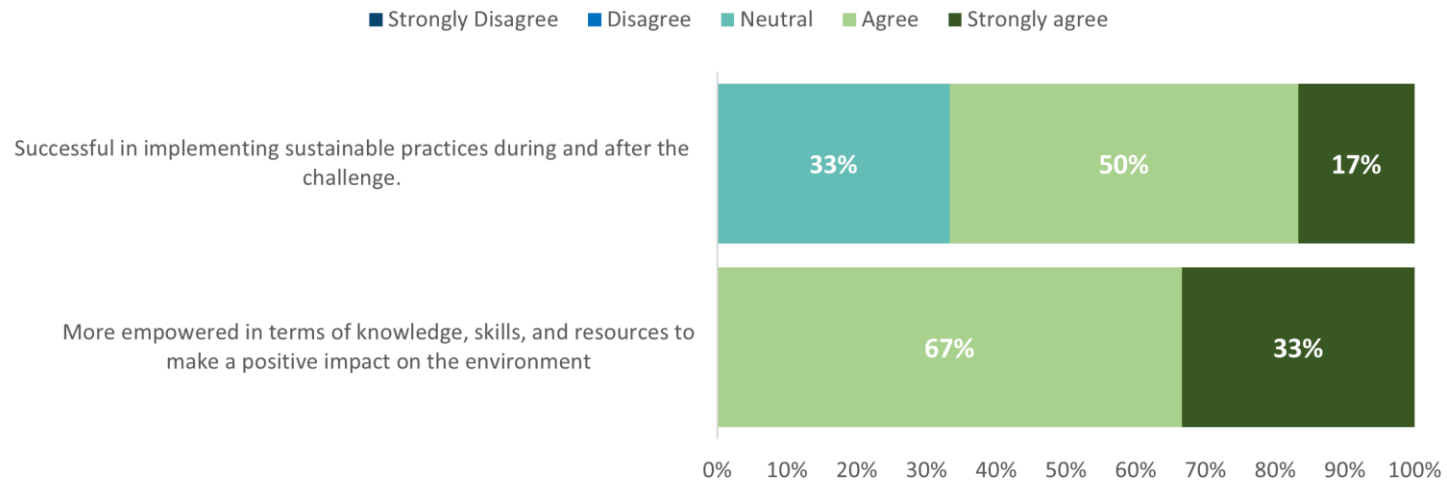
Appendix B Figure 11. Respondents who did not complete the challenge still felt more informed about environmental issues and sustainability after participating (N=6).



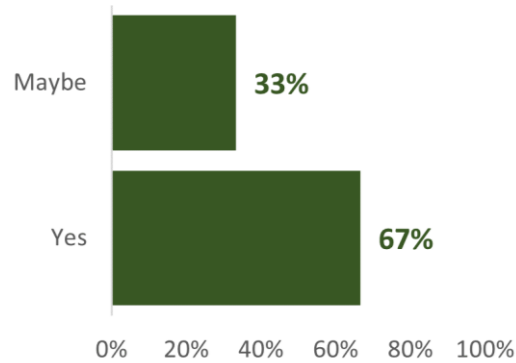
Appendix B Figure 12. Respondents who did not complete the challenge all expressed a desire to change for the environment after the challenge (N=6).



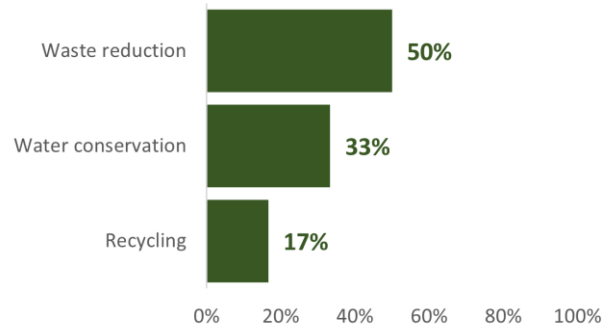
Appendix B Figure 13. Half of the participants who did not complete the challenge found it to be 'challenging' or 'extremely challenging'. However, two thirds of those participants rated their overall experience as 'good' (N=6).



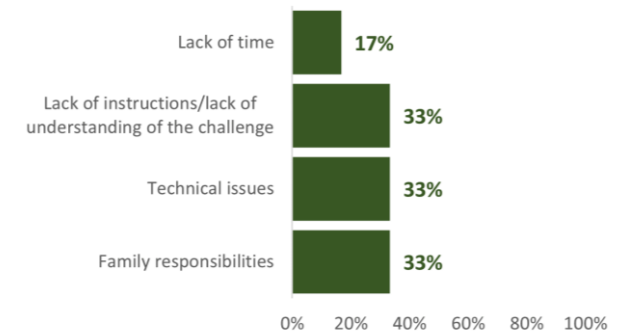
Appendix B Figure 14. Most participants who did not complete the challenge found that the challenge led them to feel more empowered and successful in implementing sustainable activities (N=6).



Appendix B Figure 16. Two thirds of respondents would be interested in participating in future environmental challenges or similar initiatives. (N=6)



Appendix B Figure 15. Waste reduction and water conservation were the top activities that participants wished had been emphasized during the challenge (N=6).



Appendix B Figure 17. The main barriers that hindered participants' ability to complete the sustainable living challenge were lack of instructions/understanding the challenge, technical issues and family responsibilities were (N=6).

Appendix C

Environmental Justice Design Sessions Agenda

Design session goals: Convene Latino community members into 2-3 design sessions in the Twin Cities Metro area and 1-2 design sessions in Southern MN with 6-8 participants. Encourage participants to offer input into the design of a community-based project that focuses on living sustainably.

Introduction

10 min

- Explain purpose of the session
- Explain what we mean by terms we are using (key words handout?)
- Address Questions they might have
- Individual Introductions: Name and share why did you decide to participate in this activity?

Part 1: Individual reflection

10 min

- Now we are moving to an activity to invite you and reflect on what you think about the environment. We will have about 10 minutes to draw responses to the following questions.
- **Fill out or draw:**
 - What does environmental justice mean to you?
 - When I think about the environment, I think about...?

10 min

Part 2: Peer sharing

2-3 min:
ice breaker

5-6 min:
peer sharing
questions

3-4 min:
large group

- Ice-breaker partners: Share what you're drawing with your partner and take turns to describe your answer.
- Pair up with partner and spend time thinking about + please pick a note-taker in your group to share your thoughts later:
 - What environmental issues is your community facing?
 - What activities do you currently do to positively impact the environment?
 - What activities do you want to learn about to make your community safer and cleaner?

Part 3: Community dreaming.

30 min

- Instructions: you will be sharing with the larger group later on your ideas
- Separate into groups to draw/design ideal community of your dreams “Design a community with your ideal relationship with the environment” Draw and design a community that reflects your vision of a healthy and clean environment.

Follow-up prompts:

- As you’re drawing, please keep in mind to share what you consider a safe and clean neighborhood such as walkability, access to food, transportation, parks, community gardening opportunities.

5 min

BREAK

- Bathroom or Refreshment Break

Part 4: Large group discussion: 5 min/group

30 min

- Tell us about what you drew/designed?
- What will take to get us there?
- What did you include? What did you choose **not** to include?
- What do you need to achieve this ideal community? What is currently missing (in the real world?)

Session Reflections

- What did you learn participating in this session?
- What is an activity that our community could work on together to get us closer to this vision?

Part 5: Closing

5 min

- Explain the next steps.
- Thanks for participating.
- Distribute incentives, etc.

Sustainable Living Challenge Survey 2023

Environmental awareness

- 1) Do you think climate change is something that is affecting or is going to affect you personally?
 - Yes
 - No
 - Don't know

- 2) How informed are you about environmental issues?
 - Not at all
 - A little
 - Enough
 - Much
 - Very much

- 3) How informed do you think you are about sustainability?
 - Not informed at all
 - A little informed
 - Quite informed
 - Considerably informed
 - Very informed

Current Environmental Practices:

4) Please share how often you do the following conservation activities:

	Never	Rarely	Sometimes	Often	Always
Recycle?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compost at home?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Engage in water conservation activities, such as taking short showers, close tap when brushing teeth and any other activity that reduces water usage?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Grow your own food at home (such as in a garden)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Buy used clothing and furniture in place of new items?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Repair your belongings or clothes?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Donate your used/old clothes when you no longer need them?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use rags and towels, in place of paper towels?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use reusable utensils such as forks, spoons, knives, and straws outside the home?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use a reusable water bottle in place of disposable plastic water bottlers?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participate in volunteer activities to help the environmental, such as river or park clean ups?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5) Please share how often you do the following transportation activities:

Transportation	Never	1 time a month	2-3 times per month	4+ times per month
Walk instead of taking your car or some means of public transport?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use a bicycle instead of taking your car or some means of public transport?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Be willing to take part in sharing cars with other people for a trip home or to work?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6) What factors, if any, have stopped you from adopting or implementing more eco-friendly practices? Please select all that apply:

- Lack of awareness about eco-friendly options
- High upfront costs of eco-friendly products
- Limited availability or accessibility of eco-friendly alternatives

- Lack of incentives or rewards for adopting eco-friendly practices
- Perceived inconvenience or inconvenience in adopting eco-friendly practices
- Lack of knowledge or information about eco-friendly practices
- Uncertainty about the effectiveness of eco-friendly practices
- Lack of time to research or implement eco-friendly practices
- Other (please specify): _____

Motivation

- 7) Do you think that with your attitude towards life you contribute to the enhancement of sustainability?
- Not at all
 - A little
 - Enough
 - Much
 - Very much
- 8) How willing would you be to change your habits to be more sustainable?
- Not at all
 - A little
 - Enough
 - Much
 - Very much
9. What motivates you to participate in this environmental challenge?
-
- 10) What is your gender identity? _____
- 11) What is your age?
- 18-24
 - 25-34
 - 35-44
 - 45-54

- 55-65
- 65+

12) What is your employment status? (Select all that apply.)

- Undergraduate student
- Postgraduate student
- Employed full time
- Employed part time
- Currently not employed
- Retired

13) Do you identify as Hispanic, Latino, or Spanish? (Select all that apply)

- No, not of Hispanic, Latino, or Spanish origin
- Yes, Mexican, Mexican American, Chicano
- Yes, Salvadorian
- Yes, Puerto Rican
- Yes, another Hispanic, Latino, or Spanish origin not listed **[Continue to question 14]**

14) If your Hispanic, Latino, or Spanish origin is not listed, please specify, which country of origin:

15) Who is participating in this challenge?

- Only me, as an individual member of the household
- Myself, with other members of the household

Your name (this will not be linked to your responses!)_____

Post-survey Only Questions

16) How strongly do you agree with the following statements?

Behavior change	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
The sustainable living challenge influenced my knowledge about sustainable practices and the impact on the environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was successful in implementing sustainable practices during and after the challenge.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Attitudinal change	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
The sustainable living challenge increased my awareness of environmental issues and the importance of sustainable practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel more empowered in terms of knowledge, skills, and resources to make a positive impact on the environment now, as a result of participating in the sustainable living challenge.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17) Have you adopted any new eco-friendly practices as a result of participating in the challenge? (Select all that apply)

- Recycling more frequently
- Reducing energy consumption at home
- Conserving water
- Using sustainable transportation methods (e.g., biking, walking, carpooling)
- Purchasing eco-friendly products
- Supporting local and sustainable businesses
- Participating in environmental volunteer activities
- None of the above

18) How strongly do you agree with the following statements?

Behavior change	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I have increased my knowledge about environmental challenges and solutions during the sustainable living challenge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participating in the sustainable living challenge significantly affected my daily habits and lifestyle choices related to sustainability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have shared my experience and knowledge gained from the challenge with others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am likely to continue practicing sustainable habits and behaviors beyond the challenge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The sustainable living challenge provided me with the necessary resources and information to adopt sustainable practices effectively	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Feedback on Challenge

19) How would you rate your overall experience participating in the sustainable living challenge?

- Excellent
- Good
- Average
- Below average
- Poor

Thank you for taking the time to complete this survey. Your feedback will help us evaluate the impact of the sustainable living challenge and make improvements for future initiatives.