Sustainable
Communities
Review

Merging Traditional Concerns
for the Environment
with the Social and Cultural Aspects
of Community Life

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ARTICLE

Social Sustainability in Turkey: Darülaceze Model

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The different dimensions of sustainability, which entered the world literature as 'sustainable development', are discussed worldwide. Especially with the discussions on global warming and climate change, the debates have gained a different dimension today. In Turkey, these debates are mostly taken with their environmental and economic dimensions. On the other hand, although there is a large area regarding social sustainability, which is the social aspect of this issue, significant studies still need to be conspicuous. Therefore, this study has been prepared to discuss social sustainability for the future of elderly care in Turkey. In this respect, the Darülaceze model, which has been serving in the care of the elderly for more than a century since 1895, is discussed in terms of demography, equality, and social justice, which are the basic parameters of social sustainability. In examining these parameters, which are handled with the social capital approach, it has been seen that Darülaceze has an intergenerational demographic aspect. In terms of equality and social justice, it has been concluded that it provides an all-encompassing social work model by ensuring social inclusion and participation, regardless of religion, language, race, gender, etc.

1. Introduction

Sustainability, which entered the world literature as 'sustainable development' for our 'Common Future' with the 'Brundtland Report' in 1987, started to be discussed with its different dimensions (WCED, 1987). Sustainability handled its environmental and economic dimensions before it was addressed from a social point of view later on (Vallence et al., 2011). Regardless of its dimensions, sustainability focuses on realizing current generations' goals by living well without harming future generations (Berlin & Adams, 2017). For this reason, sustainability studies try to calculate better than today the future results of the steps to be taken today. And accordingly, they help to develop permanent solutions by taking preventive measures.

To better understand the ever-widening scope of social sustainability, it is still necessary to explain its place in 'sustainable development' with economic and environmental sustainability. In short, economic sustainability is under discussion for profitability, business growth, and meeting the demands of the market. Environmental sustainability looks for resources and natural heritage. On the other hand, social sustainability stands out regarding demography, social justice, and equality (Berlin & Adams, 2017).

In this study, besides referencing aspects that intersect with other types of sustainability from time to time, social sustainability is within the framework of demography, social justice, and equality, which also concerns the elderly. For this reason, the situation of the elderly in Turkey is in terms of demographics with some data. Then, as a requirement of social justice, the dimension of looking at the orphaned older adults in the Darülaceze example in a sustainable way, from a transgenerational perspective, was discussed. Finally, as a requirement of social equality, the social sustainability model of the Darülaceze, which includes different religious groups and disadvantaged groups, is emphasized.

2. Theoretical and Methodological Framework

This study is an evaluation based on secondary sources. It is helpful to look at indirect studies, not direct studies, on the social sustainability of elderly care institutions in Turkey. The purpose of doing this is to lay the groundwork for studies in this field.

Social capital theory, which started with Durkheim, Marx, Bourdieu, Coleman, and Putnam, and creates an increasingly large literature, also helps us understand the social sustainability of aged care institutions. Because social capital establishes a network of relations based on state, civil, voluntary, and private enterprise in the sustainability of institutional care, it has a significant role in increasing participation and providing solidarity. It is due to the feature of social capital that can increase relationships, social trust, and a sense of belonging and enable us to look at the future with more confidence (Öztopçu, 2017).

3. Key Parameters of Social Sustainability

Social sustainability has three primary parameters: demographic transformation, equality, and social justice.

3.1. Demographic Transformation

The demographic structure of the society is essential for the sustainability of the future employees of that society (Berlin and Adams, p. 246). Many problems, especially the sustainability of care, deepen in communities where the population aged 0-14 and 65 and over is more dependent on the working people than the working population. The unemployment of the working population and the deprivation of an income-generating profession due to lack of education put the dependent population at significant risk. Moreover, the situation of illegal child labor is emerging.

In the latest research conducted in Turkey, the rate of older adults aged 65 and over is 9.7%, and the rate of children aged 0-14 is 22.4%. The ratio of the age group between the ages of 15-64 is 67.9% (Türkiye İstatistik Kurumu, 2022). The proportion of children and the elderly, which constitutes 32.1%, is considerably high. For example, this ratio is 14.3% in the elderly dependency ratio, which represents the number of older adults per hundred people of working age, which will cause severe problems in the sustainability of elderly care unless serious measures are taken.

To ensure sustainability in the life and care of the elderly, whose proportion is increasing, it is necessary to strengthen the elderly with social inclusion and to contribute to society with the silver economy. It is needed to provide opportunities for them to be 'active' individuals who can still produce despite all the difficulties in terms of social capital, not

the 'passive' individuals shown as a 'burden' utterly dependent on others. The emergence of job opportunities that do not require physical strength in the digitalized world has also opened a window of opportunity in this regard. However, to eliminate the 'digital divide' between the elderly and young people born to the Internet world as 'digital natives', they need to stop their 'digital immigrant' identity with the advantages of 'life experiences'.

3.2. Equality and Social Justice

Equality and social justice emerge in the distribution of resources, cultural recognition, and representation (Westwood, 2019). In other words, resource sharing in society does not exclude any age group. Furthermore, any age group must be culturally recognized and represented. Let's open these three points as follows:

First, from a sustainability perspective, it is seen that older adults are at a disadvantage in terms of equal and fair sharing of resources in Turkey. For example, the decrease in their previous salaries in the face of their increasing discomfort after retirement can make the working elderly poor. It is even more critical for seniors without a serious retirement plan. Moreover, the situation of the older woman, who was deprived of her right to retirement because she could not work in a paid job before, is even worse. There is an old-age pension, and the Ministry of Family and Social Services supports correcting this situation. However, more is needed to cover the difference after retirement or unemployment.

Secondly, the cultural recognition of the elderly in Turkey is insufficient compared to other age groups. Identifying the old with the old/past, and identifying the youth with the new/modern, which started with modernization, has been a distinctive feature of Turkish modernization. The cultural recognition of the elderly, who had previously been advantageous due to gerontocracy, was made unsustainable by constantly comparing them with the young. It is in question that the elderly, shown as characters one can benefit from their experiences in all areas of culture, are now confronted with all kinds of ageism. For example, in cartoons, TV series, films, theater plays, and TV programs are drawn to entertain people, the elderly face cultural exclusion and humiliation.

Finally, the representation of the elderly in decision-making bodies in society has also decreased due to official retirement. Even in muhtarlık, the minor local administration, the advisory council of elders system has also lost its prevalence. Despite the youth branches and assemblies of different political formations, the absence of such structures based on the elderly reveals this. Older people can still be in voluntary activities in non-governmental organizations. However, the elderly in this field have been behind the young in the last few years. That is because the social responsibility activities are carried out on a student basis before the undergraduate degree, and the volunteering activities are elective courses in the undergraduate program. Furthermore, AFAD, the Ministry of Youth and Sports, the Red Crescent, and other institutions in this area have made the youth more visible in the field.

4. Darülaceze Model in Social Sustainability

It is helpful to look at what social sustainability means for the elderly and the

institution where they are cared for to understand the Darülaceze model in social sustainability. The reason for this is that the physical and social changes in the world affect the elderly, who are the most vulnerable link in societies, more (Gallopin & Raskin, 2002; Laws, 1995). It requires producing more sensitive sustainable spaces for them and developing sustainable approaches. Since the physical sustainability of the Darülaceze model is the subject of another study, its social sustainability has the following basic principles.

4.1. Age Intergenerational Dimension

When the Darülaceze started to service in 1895, it was not an institution that mostly accommodated the elderly. It presented a model that includes all disadvantaged groups called 'Aceze'. For example, it hosted refugees from different parts of the Ottoman Empire, regardless of age, due to the Ottoman-Russian War of 1877-1878. It also offered shelter to disadvantaged groups who had to beg on the streets of Istanbul due to poverty, regardless of age (Yıldırım, 1996).

It socially included all age groups needing institutional care with an intergenerational understanding. For example, it has provided an intergenerational model by providing care to children in the Children's Department for orphans, young people who have a job in their workshops and mentoring the elderly, disabled people in need of institutional care regardless of age, and people aged 55 and over. Although the youth foot has weakened in the last quarter century because young people find jobs from outside and leave the institution, this gap has been closed mainly with the implementation of the Darülaceze

Dormitory and Cultural Facility Project for young people integrated with the institution on September 25, 2021.

Today, the workshops, which are now reserved for the technical studies of the institution, are reopened to the use of the youth living in the dormitory, and studies continue for the university youth to develop technological and social innovations in the field of old age. Because the Ministry of Family and Social Services has made significant progress in children's services in recent years and has taken care of orphans, the children's section has weakened a little in the Darülaceze. Still, the children's area is kept alive in coordination with the ministry for keeping intergenerational concepts. Even a kindergarten is in service for the children of the staff working there as a new step.

4.2. Inclusive Dimension Regardless Belonging

Darülaceze offers a unique model for 'social inclusion', an indicator of equality and justice, which are essential cornerstones of social sustainability. It has surrounded the members of Judaism, Christianity, and Islam with their places of worship and residents without separating them from each other. It also covered the elements of the Ottoman millet system, regardless of race or gender. The peace and satisfaction of the residents living together under the affiliation of Aceze are taken as a basis. The presence of residents from different cultures is evident. In other words, different colors enrich the institution's social structure. This riot of colors makes itself felt, especially in the institution's activities, music, games, and entertainment.

4.3. The Dimension of Universalism That Does Not Exclude Its Locality

Darülaceze has a local as well as a universal social structure. Since the first day of its establishment, the Nizamname, Regulation, based on the Western French Poverty Laws, did not ignore the universality as much as it took into account the locality. In the transition to the Republican Period (1923), almost all laws were adjusted according to the West, and radical changes were made, while the Regulation of the Darülaceze was not changed since it already had a Western standard. It shows that the Darülaceze is on a sustainable legal basis for universal human rights and dignity as well as local. In addition, Darülaceze has provided representation in its management from time to time with its administrators belonging to different religions and races. Social expression is ensured by constantly consulting with them in decision-making and taking authority.

5. Conclusion

Social sustainability in Turkey was handled with the Darülaceze model, with the basic parameters of demographics, equality, and social justice. We reached the following results: Firstly, it is not sustainable for the elderly to live in complete isolation from other age groups in terms of demographics. Living in intergenerational solidarity with different age groups offered by the Darülaceze model will also prevent conflict and ageism. Secondly, in terms of social sustainability, ensuring the equality and social justice of the elderly increased proportion to their social inclusion. In Darülaceze, religion, language, race, gender, age, etc. Social inclusion of all social segments without distinction is given as an example. Finally, social sustainability should have a universal

and a local dimension. With its regulation, it is evident that the Darülaceze offers a social-legal model according to a universal vision and its commitment to its historical local roots.

All these help Turkey's social development in terms of social capital and sustainability in care by generating socially added value.

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ARTICLE

**Sustainable Solution for Asian Carp in the United States:
Turing "Trash Fish" To "Treasure Dishes": A Case from Two Rivers
Fisheries**

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Asian carp, which are widely distributed in Asia and Europe, are
nutritious and popular with consumers. However, they are considered aggressive
invasive species that have threatened rivers, lakes, and native species in the
United States over the last decades. In recent years, several state governments
along the Mississippi River have implemented programs to eliminate invasive
Asian carp, but these did not alleviate the threat. We propose that turning "Trash
Fish" into "Treasure Dishes" might be a sustainable solution for Asian carp
compared to eliminating them. We explore the possibility of Asian carp as food
fish on American tables through Carp Solution, which focuses on reducing,
reusing, and redefining Asian carp by industrializing it. In addition, suggestions
and possible utilization methods were proposed to improve the negative
impression of Asian carp in the United States.

Introduction

Asian carp were introduced to the United States to solve algae blooms in rivers and lakes in the 1970s (Kolar et al., 2007). Unfortunately, Asian carp have no natural enemies in the local ecosystems, and the rate of reproduction soared. Due to flooding, Asian carp entered the Illinois River, and the Mississippi River Basin (Garvey et al., 2015). According to a risk assessment by the U.S. Geological Survey (USGS) in 2020, Asian carp have established dense populations in the Mississippi, Illinois, Missouri, and Maumee River. The term "Asian carp" includes bighead carp, silver carp, grass carp, black carp, and

common carp (Alsip et al., 2019; Ivan et al., 2020).

They proliferated greatly and spread throughout rivers, ate tons of plankton on which most native fish relied, reduced water quality, and severely threatened the survival of other species in waterways. Asian carp also have incredible jumping ability, jumping an average of 2.1 m over, which poses a threat to people who are boating, water skiing, or fishing (Schankman, 2015; Vetter et al., 2017).

The U.S. government has spent hundreds of millions of dollars to study and prevent the spread of Asian carp, which included capturing them with electric barriers and water guns (Garvey et al., 2015; USACE, 2010). However, the spread of Asian carp in the Mississippi River is still serious, and the current solution cannot solve the problem fundamentally.

Two Rivers Fisheries

While the increasing population of Asian carp poses a problem in the Mississippi River ecosystem, there is a market that exists in other countries where fish is a delicacy. Two Rivers Fisheries, established in 2012 in Kentucky, processes and exports varieties of Asian carp from the Mississippi River and nearby tributaries— turning an environmental problem into an exporting opportunity.

Two Rivers Fisheries contracts with local commercial fishing businesses. The company receives fish harvested from the Mississippi and Ohio Rivers, as well as Kentucky Lake, Lake Barkley, and other Western Kentucky waterways. Two Rivers is now the largest U.S. exporter of Asian carp, shipping its products to nearly a dozen countries in Asia, Europe, the Middle East, Africa, and the Caribbean. As a result of those exports, the company has created new markets for local fishermen near the company's headquarters. The company processed

over 500,000 pounds of Asian carp in 2013 and has doubled its production each year. To date, they have processed over 23.2 million pounds of fish, opened a fish market, and diversified into other products. However, COVID-19 and shipping costs presented a major challenge to the export business.

Challenge and Strategies on Carp Solution

Due to the pandemic and freight cost, Two Rivers Fisheries have to suspend exports and start to explore the domestic market. To grow the company's proposed fish businesses in the domestic market, Two Rivers Fisheries has established a strategic partnership with the Arise Veteran Foundation and the Native American community along the Mississippi and Ohio River, Located in Golconda Illinois. AVF will be working closely with the University of Illinois Extension program located at Dixon Springs on the development of agricultural bi-products from the Asian carp.

The mission of the Arise Veteran Foundation is to empower veterans and equip them to serve and work in their communities. They are developing programs to house, train, and incubate new businesses, and help companies recycle materials for sustainability and creative projects. Partner with Two Rivers Fisheries, veterans be able to find jobs either in the company or join local commercial fishing business after Arise Veterans Foundation provides specific skills training. It is a win-win strategy in

that the company has a sufficient workforce and veterans can build their careers in the industry.

For many centuries, Native American tribes have relied on hunting and fishing for subsistence and trade. Fish could be smoked or dried to be stored and traded in large quantities. Fish constituted a major portion of most Indians' diets. In partnership with Two Rivers Fisheries, the Native American community will set up fishing groups to provide Asian carp to the company and also can process the fish to prepare them as a dish for the Casino restaurant.

Through those partnerships that were formed, a vision is being developed for the invasive carp that started hitting the Mississippi and Ohio rivers. It needed to do something to combat this invasive species. There are some economic development opportunities with the fish being explored by the Illinois Department of Natural Resources in this area. With a sufficient workforce from the Arise Veteran Foundation through harvesting Asian carp from the Native American community, Two Rivers Processing Plant can supply all the fish products for the domestic market and global market, products include fresh fish, meatballs, fish cake, dumplings, sausage, salt fish, dried fish, fish fertilizer, pet food, bait, and fish bone crafts.

Fish sausage, fish dumplings, fish cakes, salted fish.

Public education on the attitude of American consumers toward Asian carp

The Chinese have accumulated a wealth of experience on how to eat Asian carp because of the long tradition of food culture. Almost all parts of the Asian carp can be used to make tasty dishes. Due to food culture differences, the perception of Asian carp differs greatly between Chinese and Americans. The biggest obstacle that prevents Americans from consuming Asian carp is the misconceptions and prejudices toward Asian carp. Due to the media that has focused on Asian carp as an invasive species that damages local ecosystems, Americans have developed a negative attitude toward Asian carp. The lack of media coverage of the nutritional and food values of Asian carp, and the lack of necessary education about Asian carp, have contributed to this negative image. Many experts have proposed some solutions to this problem. Varble and Secchi (2013) proposed that education should be a key part of the marketing campaign for invasive species so that people are fully aware of Asian carp as a potential food source. According to the study by Morgan and Ho (2018), knowledge and perception of carp were poor, and food neophobia (fear of new foods) scores were above average. Less than 15% of respondents had eaten carp, but nearly 53% were willing to try. Varble and Secchi (2013) found similar results, as over 70% of their subjects were willing to try a sample of Asian carp and 68% were willing to purchase it in grocery stores. However, at present, little information exists on public demand. Hence, redesigning and rebranding Asian Carp is an important way to change the attitudes of Americans towards Asian carp.

Asian carp have huge potential as a food source for human consumption in the United States (Keevin & Garvey, 2019). China is experienced in processing Asian carp, so they can help to process Asian carp into a variety of Asian carp products, such as frozen products, fish burgers, nuggets, dumpling fillings, dry-cured products, snacks, and canned goods. They could be produced and sold in the United States. Due to its high content of protein, fat, and many minerals, Asian carp is often used to make a variety of dietary supplements. High-quality fishmeal has high protein digestibility and high amino acid content and is a good source of pet food and feed, it also be used in soil fertilizer, foliar fertilizer, and other possibilities. In addition to the domestic market, the international market is awaiting the U.S. Asian carp products.
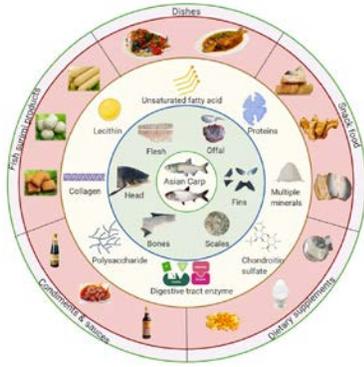
Renaming Asian carp, instead of using their original names, might reduce the negative image of them too. Some species were renamed because their original names were deemed inappropriate or offensive. Keevin and Garvey (2019) suggested that the silver carp be renamed Silver Fin (the trademark name currently used in the culinary world) and bighead carp be renamed Bighead to reduce the negative brand image of these two Asian carp.

In addition to the negative image of Asian carp in America, the safety of the product is also a concern for Americans. Thurner et al. (2014) collected a variety of species of fish in the Wabash River and the Tippecanoe River and found fewer parasites and bacteria in bighead carp than most native species. Asian carp are safe for consumption and, hence, they are a common food in many countries in Asia and Europe. There are many laws and regulations regarding the safety of Asian carp in these countries. The United States can establish its laws and regulations for Asian carp to ensure the safety of this potential food supply.

Conclusion

Successful utilization of invasive Asian carp in the United States will not only allow Americans to consume a variety of delicious Asian carp products but also effectively mitigate the Asian carp menace while providing jobs to local communities to generate significant economic value.

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ARTICLE

Predictors of Completion Status of Older Participants in Short-Term Fall Prevention Program

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Background: A Matter of Balance (AMOB), as a fall prevention program, has been improving older adults' fall-related efficacy and reducing fear of falls. However, the dropout rates of participants are relatively high. The paper aims to examine the factors associated with the completion status of the participants in this fall prevention program and provide potential suggestions for future improvement of participant retention. **Methods**: The *t*-tests were conducted to determine the cutoff point of adequate sessions. A multinomial logistic regression model was then conducted to predict the factors associated with the completion status of 737 older participants. **Results**: The completion status was defined as "inadequate" which stands for participation of less than six sessions, "adequate" for six and seven sessions, and "completion" for all eight sessions. There are 64% of participants completed the fall prevention program. Education, vision impairment, private insurance, health status, inferences of social activities, and confidence were predictors for completion status.

Keywords: Predictors, A Matter of Balance, Completion Status, older adults, fall prevention

Accidental falls among older adults could be dangerous and costly. Fall prevention programs for older adults have been shown to be beneficial (Bjerk, Brovold, Skelton, & Bergland, 2017; Hauer, Lamb, Jorstad, & Todd, 2006). A Matter of Balance (AMOB), as a volunteer lay leader model that aims to prevent falls among community-dwelling older adults, has been improving older adults' fall-related efficacy and reducing fear of falls (Yoshikawa, Ramirez, Smith, Lee, & Ory, 2020). With reduced falls, older adults could age in place longer and community sustainability could also be improved with healthy aging populations. Therefore, it is critical to scale up the program among older adults nationwide. However, dropout rates of

existing fall prevention programs are relatively high (Kesgin, Suddick, Heesen, Wright, 2021; Nilsagård, von Koch, Nilsson, & Forsberg, 2014). To maximize the benefits of participating in a fall prevention program, Osho, Owoeye, and Armijo-Olivo (2018) suggested that programs with adherence greater than 80% may result in more reduction of fall risks than those with lower adherence. As older adults drop out of the programs, the programs become less beneficial for the overall target population and then become less cost-effective when reported to funders.

Previous studies on attrition frequently focus on longitudinal research, leaving the factors associated with attrition of older adults in short-term programs (e.g., 8 weeks) understudied (Cacioppo and Cacioppo, 2018; Viken et al., 2018). According to their studies, societal factors, life experiences, program procedures, and personal beliefs and perceptions are found to be associated with participants who drop out (Cacioppo and Cacioppo, 2018).

Social supports are strong predictors for participants to complete the program while personal characteristics have moderate effects on treatment outcomes (Lippens and Mackenzie, 2011). Lippens and Mackenzie also recommend the inclusion of contextual characteristics in further studies to explore the association between environmental and personal factors and the impacts thereof on the completion rates.
Physical conditions play crucial roles in retaining older participants in physical exercise programs. Viken et al. (2018) conducted a randomized control trial among older adults who participate in physical activities, a program that lasts about three years. They reported that the

participants who dropped out of the program were older adults with low grip strength and low cardiorespiratory fitness. In acute care programs, communication and administrative procedures for recruitment are vital in preventing older adults from dropping out and clinical diagnoses are a good predictor for older adults' willingness to participate. However, to achieve a total participation rate, smooth communication is key (Wu et al., 2013).

Personal characteristics and perceptions are also crucial to retaining older adults in programs. Herman et al. (2002) studied the completion rate among older adults within a therapeutic program and concluded that self-reported anxiety and life satisfaction are good predictors for both completion and treatment outcomes regardless of treatment conditions. Similarly, Gavin and Myers (2003) reported the completion patterns among older adults in Tai-chi and line dancing programs and found that expectations, past experiences, and perceived ease of learning the movements are strongly associated with the completion rate. Viken et al. (2018) also reported that participants with lower levels of education were more likely to quit the three-year program. Smith et al. (2012) conducted two separate binary logistic regression analyses to explore the predictors of completion status and found that females were less likely to complete the program, participants who finished high school tend to have adequate dosage and/or completion. A Matter of Balance is a fall prevention program that has been successfully implemented nationwide. This study focuses on its implementation in location anonymized for Review. We noticed that the post-survey rates among older adults in this short-term fall prevention program

were at 64%, indicating that about 36% of the participants did not finish the program or missed the last session of the program. In this light, retaining participants in fall prevention programs should be considered an important goal. Therefore, this study aims to explore the factors associated with the levels of completion for this short-term fall prevention program in the Dallas-Fort Worth (DFW) area.

To categorize the completion status, we need to first identify the number of sessions with which participants could get a significant improvement in fall-related efficacy and an adequate dosage. Smith, Ory, Belza, and Altpeter (2012) did a study about the attendance of the AMOB program. That study divided the completion status into three categories: inadequate (1 to 4 sessions), adequate (5 to 7 sessions), and complete (8 sessions). Mielenz, Durbin, Hertzberg, and Nobile-Hernandez (2017) also used the five-session cutoff point as an adequate session. The adequate point is somewhere between 5 to 6 sessions.

Upon previous findings, the current study aims to use polynomial analysis to determine the predictors of completion status as it renders more information when comparing between categorized outcome variables (Kleinbaum & Klein, 2010). Furthermore, as mentioned in Mielenz et al.'s (2017) study the sample was predominated by Hispanics, which may bias the generalizability of the research findings. This study tends to verify the cutoff point of the number of adequate sessions as the original suggestions were proposed 11 years ago (*AMOB replication report*, cited in Smith et al., 2012).

In brief, the paper aims to confirm the adequate sessions for participants to get

enough improvement in fall prevention; to examine the factors associated with the completion status of the participants in this eight-week fall prevention program; and to provide potential suggestions for future improvement of participant retention.

Methods
Design and Procedures

This study uses quantitative and descriptive methods. Institutional Review Board (IRB) was approved by a public university. The paper-based original data was collected by the Area Agency on Aging (AAA) from the fall prevention program A Matter of Balance. Student assistants manually imputed the data into a digital version and cross-validated each other's work.

Settings and Participants

The AMOB fall prevention program is operated by AAA. Two major goals of AMOB are to increase muscle strength and confidence in self-management of falls (CSMoF; Anonymised for Review #1; Mielenz et al., 2017; Smith et al., 2012). The pre-and post-survey of 737 participants were collected. Of all cases, 46 participants younger than 65 were removed from the study. The sample size included in the final data analysis consisted of 691 participants. The mean age of participants was 76.23, ranging from 65 to 97. The sample was predominated by females (76.1%) and European Americans (95%). Other ethnic groups included 20 Asian Americans (2.9%), 10 African Americans (1.4%), 4 American Indian or Alaska Native (0.6%), and 3 Native Hawaiian or other Pacific Native (0.4%). Four hundred (57.9%) participants were married, followed by widowed (n = 190, 27.5%), divorced (n = 70, 10.1%), and other (n = 31, 4.5%). Regarding living

arrangements, 462 (66.9%) participants reported living alone. The sample exhibits good overall education as 398 (57.6%) participants held a college degree and above and 220 (32%) had some college education. In terms of health conditions, 359 (52%) had

Table 1. *Participant Characteristics (N = 691).*

Characteristics	*n* (%)	*M* (SD)
Demographic variables		
Age		76.23(6.44)
Living alone		
Yes	229(33.1)	
No	462(66.9)	
Sex		
Male	165(23.9)	
Female	526(76.1)	
Hispanic		
Yes	17(2.5)	
No	674(97.5)	
Ethnicity		
American Indian or Alaska Native	4(0.6)	
Asian American	20(2.9)	
Black or African American	10(1.4)	
Native Hawaiian or other Pacific native	3(0.4)	
European American	654(94.6)	
Education		
Less than high school	2(0.3)	
Some high school	4(0.6)	
High school graduate or GED	67(9.7)	
Some college or vocational school	220(31.8)	
College graduate or higher	398(57.6)	
Marital status		
Married	400(57.9)	
Widowed	190(27.5)	
Divorced	70(10.1)	
Separated	3(0.4)	
Other	28(4.1)	
Chronic conditions		
Arthritis	359 (52)	
Breathing	94 (13.6)	
Depress	80 (11.6)	
Diabetes	113 (16.4)	
Heart disease	163 (23.6)	
Vision limitations	98 (14.2)	
Perception of falls		
Limitation	212 (30.7)	
Fall frequency		0.51 (1.22)
Resulted in injury		0.16 (0.58)
Fear of falls		2.86 (0.87)
Health status		3.34 (0.80)
Poor	1 (0.1)	
Fair	88 (12.8)	
Good	326 (47.2)	
Very good	226 (32.7)	
Excellent	50 (7.2)	

arthritis, 94 (13.6%) had breathing issues, 80 (11.6%) had depressive symptoms, 113 (16.4%) had diabetic conditions, 163 (23.6%) had heart diseases, and 98 (14.2%) had vision impairment. Table 1 concludes the demographic characteristics of participants.

Measurements

Completion Status. The AMOB has eight sessions for 16 weeks. The completion status was coded as 0 (inadequate), 1 (adequate), and 2 (completion). Participants reported their attendance at each session and the total number of sessions they had participated in. The final coding for the completion status would be determined by a series of paired t-tests.

Chronic Conditions. The survey of AMOB asked participants to select yes or no from seven chronic conditions, including arthritis, breathing issues, depressive symptoms, diabetic conditions, heart diseases, and vision impairment.
Health Status. Participants reported their self-perceived health status on a 5-point Likert scale from 1 (Poor) to 5 (Excellent).

Fall History. The perceived limitations of social activities because of concerns about falls were measured, as 1 stands for yes and 0 for no. The incidents of falls and the injuries due to falls during the past three months were measured as continuous variables. A 4-point Likert scale ranges from 1 (Not at all) to 4 (A lot) gauged fear of falls.

The Confidence in Self-Management of Falls (CSMoF). The AMOB program asks participants to rate a set of statements on a 5-item Likert scale. Examples of the statements included "I can get up when I fall" and "I can protect myself while falling". This set of questions was designed to measure CSMoF. The

Cronbach's Alpha of the CSMoF scale was .837. A confirmatory factor analysis (CFA) was quickly performed to verify the validity of the measurement. All five items loaded statistically significant toward one dimension, CSMoF, and the fit of the model was satisfactory: $\chi^2(4) = 14.04$, p = .007, RMSEA = .06, and CFI = .993 (Acock, 2013).

Demographic Variables. Participants reported their age, gender, ethnicity, marital status, educational attainment, and living arrangements.

Data Management

The number of missing cases ranged from six to 23 across the data set, but no variable had more than 10% of the total cases missing. We completed Little's missing completely at random (MCAR) test and rejected the null hypothesis that the pattern was MCAR. Mean substitution was made for continuous variables (e.g., age, and CSMoF), and mode substitution was applied for categorical variables (e.g., education, marital status, and health status; Acock, 1997; Schumacker & Lomax, 2016)

Data Analyses

To determine the cutoff point of adequate sessions, attendances were recoded to a series of dummy variables. For example, variable Five stands for the participant who attended at least five sessions, and Six for at least six sessions. Variable improvement was calculated by subtracting pre-CSMoF from post-CSMoF. A series of paired *t*-tests were conducted, examining the mean difference by groups such as more than six sessions versus less than six sessions. The *t*-test was statistically significant when grouped by variable Six, with a mean difference of .64, *t* = -1.877, *p* = .031. Levene's test resulted in a statistically

insignificant *p*-value of .850, *df* (1, 439), indicating a homogeneity of variance. Given this outcome, the completion status in this study was defined as "inadequate" which stands for participation of less than six sessions, "adequate" for six and seven sessions, and "completion" for all eight sessions.

Given the ordered and categorical nature of the dependent variable, an ordered logistic model (OLM) is preferable. However, the assumption of proportional odds across response categories was violated, $\chi 2 = 22.03$, df = 7, *p* = .003. A multinomial logistic regression model was then conducted to perform the analysis as it has loose assumptions on the proportional odds (Long & Freese, 2006). This study reported relative risk ratios (RRR) of predictors. The sample size of 691 met the minimal requirement of multinomial logistic regression as suggested by Thompson (1987) that with a significance level set to .05 and a dependent variable of three categories, the sample size should be greater than 510.

We further classified the completion status of the program with predictors in the regression model and a binary outcome (complete and adequate versus inadequate) using a classification and regression tree (CART) model (Khadanga, Savage, Gaalema, & Ades, 2021; Lemon, Roy, Clark, Friedmann, & Rakowski, 2003). The tree model predicts outcomes with more flexible cutoff points within predictors. The CART model was achieved using the *rpart* package (Thernau, Atkinson, & Ripley, 2013) in RRR (v.4.1.1) and R Studio (2021.09.0+351).

Results

Descriptive

Of all participants, 179, 313, and 199 cases were categorized as "inadequate", "adequate", and "completion", respectively. And the completion status was included in the logistic model as the dependent variable. The multinomial logistic regression was statistically significant, $\chi^2 =$ 73.79, *df* = 42, *p* = .002. Among the predictors, education, vision impairment, private insurance, health status, inference with social activities, and mean CSMoF were found to be predictive for at least one pair of categories of the outcome. Participants with college and above educational attainment tend to have a significantly lower chance of achieving completion while controlling for other variables. An increase in education is associated with a drop of 66% toward completing the fall prevention program, R = .34, *z* = -2.73, *p* <.001. Higher education is also associated with a lower probability of getting adequate sessions from the program, RRR = 0.49, *z* = -1.86, *p* = .03. The finding indicates that participants with higher education are more likely to have inadequate status.

Participants with vision impairment were more likely to achieve "adequate" rather than "inadequate", with a RRR of 2.47, *z* = 2.35, *p* = .009. This result shows participants with vision impairment are more likely to have adequate sessions and then stop participating, and vision impairment was associated with lower odds of getting "completion".

Private insurance coverage was also negatively associated with "adequate" and "completion" status, as both Rs of private insurance were smaller than 1. Compared to

"inadequate" the RRR of "adequate" was 0.48, *z* = -2.90, *p* = .001.

Interference of social activities predicted a lower probability of completing the program, as RRR = .76, *z* = -2.19, *p* = .01. Perceived interference of social activities due to falls limits participants from completing the sessions.

Participants who perceived social limitations due to concerns about falls were less likely to complete the fall prevention program with full sessions, RRR = 0.76, *z* = -2.19, *p* = 0.28. Similarly, though not significant, such participants also demonstrated lower rates of having an adequate dosage of the program and were more likely to drop out of the program.

Health status was a strong predictor of "completion" and "adequate". The corresponding RRRs of "adequate" was 1.52 (*z* = 2.97, *p* < .001) and 1.48 (*z* = 2.56, *p* = .005), respectively. This reveals that participants with better health status tend to complete the prevention program more than those who reported worse health status.

A higher level of CSMoF also predicts a lower possibility of completing all the sessions. Compared to "inadequate", participants with higher levels of CSMoF were less likely to fall into "completion" with a RRR of .92, *z*= -2.16, *p* = 0.015. Table 2 presents the relative risk ratio, 95% confidence interval, and z scores from the multinomial logistic regression model.

Table 2. *Outcomes of Multinomial Logistic Regression With Completion Status as Dependent Variable.*

	RRR	Std.Err	*Z*	95 CI
Inadequate	**Reference group**			
Adequate				
Age	1.01	0.02	0.40	[0.97:1.04]
Sex	0.81	0.20	-0.84	[0.50:1.31]
Education				
High School	0.56	0.23	-1.43	[0.26:1.23]
College and above	0.49*	0.19	-1.86	[0.23:1.04]
Married	1.2	0.33	0.66	[0.70:2.04]
Live alone	1.06	0.30	0.21	[0.61:1.86]
Depression	1.27	0.38	0.80	[0.71:2.29]
Vision issue	2.15*	0.66	2.47	[1.17:3.93]
Private insurance	0.48***	0.12	-2.90	[0.29:0.79]
Interfered social life	0.86	0.09	-1.41	[0.69:1.06]
Limited life due to falls	0.88	0.20	-0.57	[0.56:1.37]

Fear of falls	1.13	0.16	0.91	[0.87:1.48]
Health Status	1.52***	0.21	2.97	[1.15:2.00]
Confidence in self-management of fall	0.97	0.03	-0.94	[0.90:1.04]
Full complete				
Age	1.02	0.02	0.97	[0.98:1.05]
Sex	0.72	0.20	-1.22	[0.42:1.23]
Education				
High School	0.6	0.25	-1.23	[0.27:1.35]
College and above	0.34***	0.13	-2.73	[0.16:0.74]
Married	1.61	0.50	1.54	[0.88:2.94]
Live alone	1.6	0.51	1.49	[0.86:2.98]
Depression	0.55	0.21	-1.58	[0.26:1.16]
Vision issue	1.46	0.51	1.10	[0.74:2.89]
Private insurance	0.81	0.22	-0.80	[0.48:1.36]
Interfered social life	0.76*	0.09	-2.19	[0.6:0.97]
Limited life due to falls	0.88	0.22	-0.51	[0.53:1.44]
Fear of falls	1.05	0.16	0.33	[0.78:1.41]
Health Status	1.48*	0.23	2.56	[1.1:1.99]
Confidence in self-management of fall	0.92*	0.04	-2.16	[0.85:0.99]

According to the tree classification, the classifying rules were reported in Table 3. Focusing on conditions that predict inadequate status, participants with higher than college degrees, whose health is not in good shape, covered by private insurance, and with arthritis are predicted to have inadequate status. Among participants with less than college degrees, if they were covered by private insurance only and not covered by Medicare were also predicted to not complete the program. Figure 1 presents a tree plot showing the classifying paths under each condition.

Discussion

The finding of the study updates the cutoff point of adequate dosage in the AMOB program. The adequate dosage identified in this study is attending at least six sessions, which is right on or a little higher than the cutoff point suggested by

Table 3.
The Classifying Rules Used in The CART
Model.

Status	Com Incom		Conditions	Proportion
complete	[84% : 16%]	when	Education < College & Medicare is Yes	41%
complete	[82% : 18%]	when	Education >= College & health is not good & Private insur. is no	19%
complete	[82% : 18%]	when	Education >= College & health is not good & Private insur. is Yes & Arthritis is No	3%
complete	[80% : 20%]	when	Education < College & Private is No & Medicare is No	3%
complete	[80% : 20%]	when	Education >= College & health is good & Eye issue is Yes	6%
complete	[78% : 22%]	when	Education >= College & health is good & Eye issue is No & Live alone is No & Gender is Female	9%
complete	[72% : 28%]	when	Education >= College & health is good & Eye issue is No & Live alone is No & Arthritis is No & Gender is Male	5%
complete	[65% : 35%]	when	Education >= College & health is good & Eye issue is No & Live alone is Yes & Heart disease is No	6%
Incomplete	[38% : 62%]	when	Education >= College & health is not good & Private insur. is Yes & Arthritis is Yes	2%
Incomplete	[29% : 71%]	when	Education < College & Private is Yes & Medicare is No	1%
Incomplete	[29% : 71%]	when	Education >= College & health is good & Eye issue is No & Live alone is Yes & Heart disease is Yes	3%
Incomplete	[18% : 82%]	when	Education >= College & health is good & Eye issue is No & Live alone is No & Arthritis is Yes & Gender is Male	2%

Note. Com: proportion Complete; Incom: Inadequate.

Figure 1. Tree Classification.
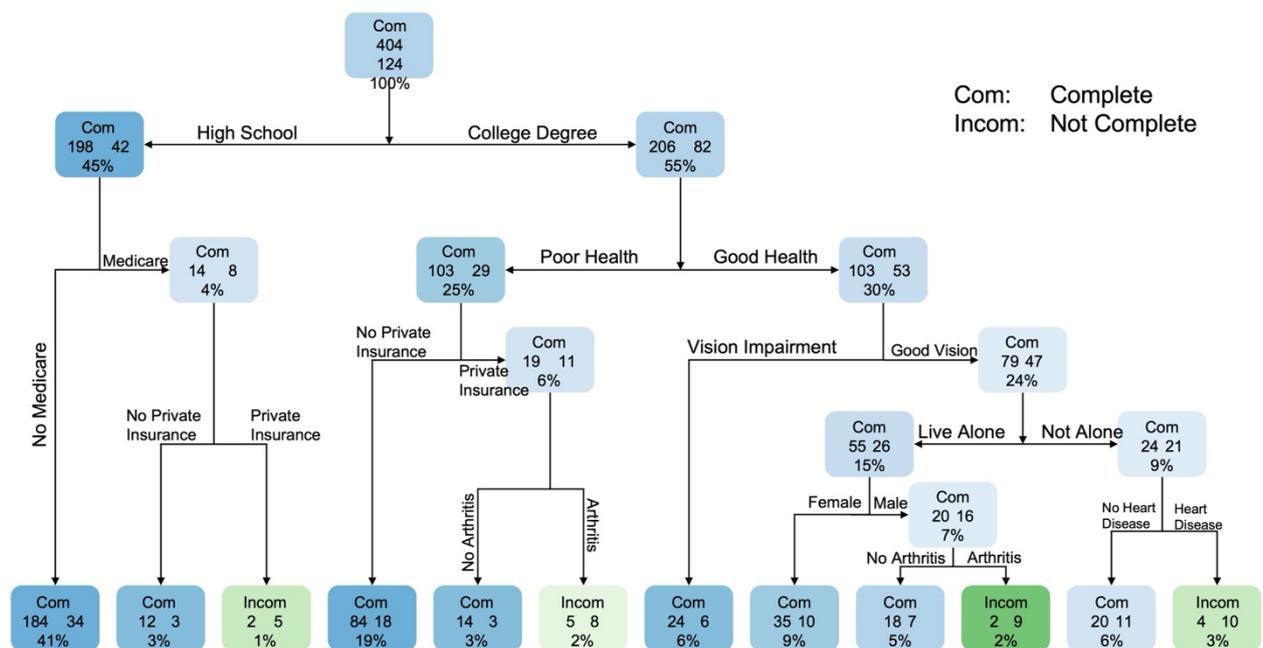
Smith et al. (2012; 5-6 sessions) and Mielenz et al. (2017; 5 sessions).

This exploratory study also found that many of the hypothesized factors were not predictors of completion status for fall prevention programs. For example, fear of falls, fall history, and perceived limitations due to falls were not associated with the participant's completion status of the fall prevention program. To our surprise, participants with higher levels of education were more likely to drop out of the program while those with relatively lower levels of educational attainment tend to stay and achieve completion. This finding is contrary to a previous study that found participants

with lower education are more likely to quit the fall prevention program organized in the northern part of America (Viken et al.,2018). The finding supports a previous study finding that older adults with high school-level education are more likely to complete the program (Smith et al., 2012). One possible explanation for this increased inadequate rate for people with higher educational attainment is that this population may have better health status as well as more sources and information about fall prevention. Therefore, they are less likely to get excited about new information from fall prevention programs.

From our study, we did not see a statistically significant difference between genders regarding the completion status. When compared to older adults who did not achieve adequate sessions, the male gender demonstrated a lower likelihood of completing than females, and the findings are contrary to that from the Smith et al., (2012) study.

Older adults with chronic conditions such as depressive symptoms and/or vision impairment demonstrated more likelihood of attending adequate sessions of the fall prevention program but were less likely to finish all the sessions. It is noteworthy that vision impairment is a risk factor for unintentional falls. Therefore, participants with visual impairing conditions are in fact at risk. In this light, it is no wonder that they intend to finish the adequate dosage of program sessions. However, once they feel that they know enough about how to prevent falls given their conditions, then they might exhibit less interest in staying in the program.
Private insurance coverage predicted lower probabilities of having adequate or complete. This might be due to access to care providers who also provide fall prevention information.

Health status, intuitively, becomes a strong predictor of participants' completion status, as a better health status leads to a higher chance of completing the whole program. This finding was not surprising yet it is so important to note that participants with poor health status or with conditions are then less likely to finish the whole program and to benefit more from all the sessions. Many reasons could contribute to this situation. Poor health conditions prevent participants from attending sessions they want to attend, or the practices are too challenging for them and cause them to drop out of the program. People with poor health conditions may share a high risk of falling, so assisting them with some extra efforts could retain them longer in the program and extend the benefits of participation.

People with a higher level of CSMoF also exhibited a lower probability of completing the program. But is understandable that people with higher pre-survey scores may have known most of the fall prevention information. A better organization of information and a comprehensive overview could help participants quickly locate their information of interest because having a higher level of CSMoF may not mean that the participants are able to prevent falls, it only means that they have confidence in controlling falls, which may or may not be correct.

Implications

The recruitment strategy for short-term fall prevention programs could be more focused on the geographic areas with relatively lower levels of educational attainment. Older adults with lower levels

of education are usually underrepresented because they have limited information regarding the program's availability, and some may need language support for immigrants or residents with less English proficiency. Some of the participants may have a very specific purpose when participating in fall prevention or similar programs. They may have certain health conditions that pose higher risks for them to fall or have other hazardous events, therefore, they have an urgent to learn how to prevent the risks for their specific conditions. Program organizers may need to strengthen the orientation of the program to help participants understand that the information in each session was carefully designed and needs to be delivered in order to have a better prevention outcome. Furthermore, answering questions regarding program expectations could also better serve participants with health conditions as each condition impacts one's behaviors differently.

Another implication for practice is to focus on participants with lower health status because they may need extra help from both peers and instructors. Given the fact that participants are coming in with various levels of CSMoF, program designers and facilitators may pay attention to these participants because they could be good role models. Sharing with their peers about their confidence in fall prevention could assist them in staying longer in the program and learning more evidence-based fall prevention strategies that could help them in practice. For future studies, qualitative research strategies could also be used because the reasons for completion status could be highly individualized. Personal events, responsibilities, interests, expectations, etc., may all impact the

completion status of the fall prevention program. Thus, other than quantitative data analyses in the current study, future studies are encouraged to apply qualitative or mixed-design studies to better explore the factors associated with the completion rate of fall prevention programs among older adults.

In addition to conventional regression-based predictive models, this study applied classification tree modeling to demonstrate the paths leading to each completion status based on participants' characteristics. The tree model finds the cutoff points in each variable where the completion status could be distinguished. With more data collection in the future, the accuracy of the model could be improved and then be able to make accurate predictions.

With more successful fall preventive programs that are implemented at community levels, older adults could maintain their mobility levels and increase the quality of life in communities. As a result, the sustainability of both healthy aging and community development may be achieved.

Limitations

The study has some limitations. Given the exploratory nature of the study, many of the measurements and survey items were not designed specifically for this completed research question. For example, health status could potentially include more specified items such as body mass index (BMI), transportation selections, and caregiving responsibilities, which may also be highly correlated with completion status. The second limitation is the composition of the sample. The sample was predominately white, highly educated, and mainly female

participants. This may bias the finding that higher education lowered the probability of "completion". Future studies could use a stratified random sampling strategy to reduce this potential bias. The third limitation is that we should not draw a causal relationship from a cross-sectional study, although the association between the factors and the completion status was significant statistically.

Despite the limitations, the study adds to the existing literature with empirical evidence from a population that is different from the previous studies (i.e., the Hispanic population) and has identified the association between completion status and personal conditions. This is critical information for future program design and recruitment.

Conclusion

Fall prevention programs benefit not only older adults who have a high risk of falling but also the whole U.S. healthcare system by reducing healthcare expenditures. Prevalent fall prevention programs have relatively lower levels of completion rates. This study has explored several potential predictors that explain why participants achieve "completion" status and has found that education, vision impairment, private insurance, health status, perceived inferences of social activities due to falls, and CSMoF were predictive for completion status. Suggestions for retaining current participants and recruitments for future participants were provided.

Acknowledgment

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ARTICLE

Typification of Coffee Tours in Costa Rica:
value of culture for rural communities

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Abstract

Costa Rican coffee tours provide varying amenities, experiences, specializations, and offerings for visitors. This research provides an exploratory approach to identify and categorize the various coffee tours in Costa Rica while offering a case study of how coffee culture is been used in the growing Agri-tourism sector of the country. The objective of this research was to perform the identification and typification of coffee tours produced by companies in the country. The study was conducted from November 2020 to April 2021. The data was collected through short-answer surveys from owners, administrators, and employees of coffee tour operations. Twenty-four surveys of coffee tours were collected throughout Costa Rica from six provinces. The research provides findings of varying offerings and characteristics that were categorized into three distinct groups.

Introduction

Coffee tours are a common feature of Costa Rica tourism. Based on this country's rich history of high-quality coffee bean production, it is not surprising that foreign and domestic tourists alike are interested in learning about coffee: its production, processing, commercialization, culture, and so on. However, it is difficult to pinpoint the differences in offerings between companies offering coffee tours and the differences in offerings among competitive coffee tours. According to the Ministry of Tourism, foreign visitors stayed in Costa Rica for an average of 12.6 days and spent an average of $1,400 in 2019 (ICT). With such large and consistent numbers of visitors to Costa Rica, identifying and categorizing coffee tour companies provide a competitive advantage providing their offerings to

their target market and how these companies stand out from their competition to target and attract these visitors to their businesses. It is hypothesized that coffee tours are heterogeneous in terms of what amenities and experiences are offered to visitors and that definable subgroups can be identified from the coffee tours in Costa Rica. Furthermore, the different types of offerings may indicate different degrees of willingness to culture-sharing from entrepreneurs. This research aims to identify, distinguish, and characterize the various coffee tours that operate in Costa Rica.

Literature Review
Coffee Culture and Tourism in Costa Rica

Costa Rica is a popular destination for North Americans. Tourism has been Costa Rica's most important industry for many years (Biesanz et al., 1999). Out of the 3.1 million international visitors to the country in 2019, more than half came from North America with 1.3 million tourists coming from the United States, by far the largest tourism market for the country. The second-largest market, Europe, reached just above 500,000 visitors to the country in the same year (*Anuario Estadístico de Turismo 2019*).

Many coffee-related tourism projects have been initiated in coffee-producing countries, including Costa Rica recognizing the value of sharing coffee culture with the visitors. Candelo et al. (2019) found that the four main benefits for the local communities of farmers and their families are empowerment and cooperation, business diversification, sustainability, and the creation of a destination image. Coffee tourism is viewed to be creating favorable and appealing conditions for tourists. Coffee in Costa Rica is very popular with its residents as well as the millions of international tourists who visit the country every year. Costa Rica arguably produces some of the best coffee in the world and this valuable commodity is exported throughout the world in specialty markets. The unique coffees produced by each farmer present a full spectrum of tastes and aromas uniquely brewed in each region of the country. Also, there is a collected knowledge and tradition of how to cultivate, process, and prepare coffee. For example, since 1989, all coffee produced in Costa Rica is legally required by law to be arabica beans to maintain a high quality (Law No. 19302-MAG). Costa Rican coffee is now exported around the world and eventually became known as one of the highest-quality coffees available (Pendergrast 2010: 40-41, 154).

The Costa Rican Coffee Institute (ICAFE) divides the coffee-growing areas into eight coffee-growing regions: Central West Valley, Tarrazu, Tres Rios, Orosi, Brunca, Turrialba, Central Valley, and Guanacaste. The highest quality coffee is grown approximately 1,200 to 1,700 meters above sea level and the beans are grown from September to December in a shorter season. Lower-quality coffee is typically grown below 1,200 meters below sea level, with a longer growing

season from late June to December. The International Coffee Association states that for the crop year commencing in 2018, Costa Rica produced 1,427 thousand 60kg bags (2018). "Nowadays, close to 40% of Costa Rica's coffee exports are classified as high-quality coffee beans that sell at a 40% premium when compared to traditional Arabica" (FAO, 2018).

Coffee tourism in Costa Rica

An increasing amount of coffee professionals and coffee enthusiasts are traveling to coffee-growing regions, observing the early stages of the coffee production chain (Sanchez, 2008). Therefore, diversification of coffee operations is a feasible option for these farms to implement other forms of revenue through coffee tourism. Coffee tourism can be defined as "being related to the consumption of the coffee, history, traditions, products, and culture of a destination" (Jolliffe, 2010g: 9). Coffee tourism is considered a subcategory of rural tourism (Boniface, 2003). One of how coffee tourism is practiced is through coffee tours executed by companies that grow coffee beans. The production of coffee contains numerous steps in processing before achieving the cup as a beverage and these processing methods and areas are important attractions (Kleidas and Jolliffe, 2010). Coffee tourism can be classified in many ways, such as being a part of a cultural and culinary tourism initiative (Jolliffe, 2010a). Coffee tourism can also be classified under special interest tourism (Weiler and Hall, 1992) or niche tourism

(Robinson and Novelli, 2005) such as tourism involving research. Coffee tourism can also be listed under agritourism. Agritourism may be defined as "any practice developed on a working farm to attract visitors" (Barbieri and Mshenga, 2008). Pendergrast (2010b: 367-368) describes visits to coffee farms during the harvesting season as coffee ecotourism and calls coffee tourists "ecotourists".

Coffee tours and rural communities

Visitors and tourists experiencing coffee tours have the benefit of seeing the full production of the coffee supply chain, from the beginning stages of growing the coffee beans at the farms until the coffee is processed and ready to be exported at the production facility. The attractions identified along this supply chain have been identified in relevant literature in the coffee tourism field observing the potential for coffee farm and community tours and visits, coffee trails, production facilities or factory visits, and cupping (e.g. Anbalagan & Lovelock, 2014; Brennes et al., 1997; Kleidas and Jolliffe, 2010; Lyon, 2013; Whyte, 2008). Jolliffe (2010) notes that many coffee farm owners consider coffee tours or experiential activities as important opportunities to educate their clients about the various operations and productions that make the difference in distinguishing great coffees from each other.

Coffee tourism in rural areas is less accepted by the academic community and the public than wine tourism (Yun, 2014), and studies of coffee tourism typologies

are limited. However, coffee tourism does seem to share similarities with wine tourism. Karlsson and Karlsson (2017) list the prerequisites required to be considered coffee tourism: coffee tourism has to be implemented in an area where coffee beans are grown and produced, coffee tourism has to disperse information and education about coffee, and the tourist experiences the coffee-making process and can try the coffee produced on site (2017). The research team also categorized tours into traditional, educational, and comprehensive types.

Traditional types may provide tours or tastings for visitors, but no design of specific experiential activities is involved. Tourism is not the primary source of income for these estates. Educational tours include information on growing coffee, as well as providing visitors with tours and coffee samples. These coffee estates provide classes and experiences for visitors that further educate the topics of coffee. Comprehensive coffee estates comprise growing coffee, providing coffee-related activities, and providing meals and accommodations (Karlsson and Karlsson, 2017). Coffee tours in Costa Rica do not share the same clientele or offering types, nor do they necessarily cater to the specific types of tourists and consumers as wine tours. A more in-depth investigation of the typology of coffee tours is needed to understand the connection between coffee and tourism and the way these Costa Rican coffee tours create experiences at coffee destinations for visitors.

Methodology

The objective was to perform the typification and characterization of coffee tours produced by companies in Costa Rica to develop a categorization of coffee tours within Costa Rica. The first step was to identify all coffee tours in Costa Rica. Following Terziyska's study on wine tours (2018), the research began with the content study of the websites of companies offering coffee tours in Costa Rica and providing online information on their coffee tours. An internet search using the keyword "coffee tours in Costa Rica", was performed in English, and then recorded. Various Google searches were utilized to identify coffee tours to contact. Online searches (e.g. coffee tour Costa Rica) provided a majority of coffee tours. Other tourism websites (e.g. TripAdvisor) and Costa Rica tourism blogs (e.g. https://costaricaexperts.com/costa-rica-coffee-plantation-tours/, https://news.co.cr/costa-rica-coffee-tours-cupping/2989/) also listed coffee tours that were then investigated to find contact information. No national register of coffee tours with the Ministry of Tourism or other institutions in Costa Rica was found through online searches. Once the name of the coffee tour was found, the researcher recorded pertinent information about the company and contact information, including name, website, email, and phone number. Forty-two companies conducting coffee tours

were found and invited to fill out the survey.

A survey was constructed to gain any pertinent information regarding coffee tours in Costa Rica. Each survey question contained both English and Spanish to be inclusive. The survey contained 23 short-answer, multiple-choice, and single-answer questions about the company in general and specifically the company's coffee tours. It contained questions concerning the number of years the company has been in operation, the number of years of conducting coffee tours, the length of time of the coffee tours, price, what is learned on the tour, additional amenities, online presence, and social platforms, special characteristics, certifications, etc. A pilot test of the survey was reviewed and completed by Costa Ricans to ensure the correct translation and meaning of each question.

The next step involved sending out the survey to each business providing coffee tours, indicating the intent of the research. Businesses were sent a link by email or WhatsApp to an online survey concerning their business and coffee tours to gain insight into the characteristics and offerings of their coffee tours. Companies providing coffee tours were contacted a second time if no response or survey was done. Some companies were reached by WhatsApp, Facebook, and phone if a response was not provided. Based on Wang et al's research analyzing tourism experiences (2019), the coffee tours needed to fit three criteria to be studied: open to the public,

provide coffee experience activities and offer coffee tours. Survey results were analyzed to discard those without these three criteria.

The main variables that characterized the coffee tours were then subjected to a hierarchical cluster analysis using the Ward grouping method and Gower general coefficient as the distance measure, as developed by Ward (1963). The objective of cluster analysis was to address heterogeneity in the data set from the surveys. Clustering can also help marketers find distinct groups in their customer base and characterize their customer groups of customers based on various distinctions.

Results and Discussion

The results included usable surveys from twenty-four companies providing coffee tours in Costa Rica. Six provinces were represented: Alajuela (6), San Jose (6), Cartago (4), Guanacaste (1), Heredia (1), and Puntarenas (5). The respondents were 9 administrators/managers, 3 employees, and 11 owners/producers. 15 companies have been in operation from 1-10 years, 5 companies from 18-37 years, 2 companies from 55-73 years, and 1 over 100 years. Eleven companies have been providing coffee tours for up to 7 years, 7 companies for 8 to 16 years, and 5 companies providing coffee tours for more than 16 years. The primary purpose companies began offering coffee tours was consolidated and fell into four categories: consumer demand (2), diversification (11), education (6), and

promotion (5). Coffee tour times ranged from 1 hour up to 4 hours, with the majority of coffee tours around 2 hours. Coffee tour prices ranged from $10 up to $45 for foreigners, with the majority of prices between $20-40. Every company has a target market for international visitors. Of the target markets listed, 8 companies checked 1-3 target markets, 10 companies checked 5-6 target markets, and 6 companies checked 7-9 target markets. All companies surveyed but one responded with having at least 3 social media platforms. 3 companies checked 1-2 activities conducted on their coffee tours, 7 companies checked 4-6 activities, 7 companies checked 7-9 activities, and 7 companies checked 10-11 activities. Out of the additional amenities, 9 companies checked 6-8 amenities, 11 companies checked 9-10 amenities, and 4 companies checked 11-15 amenities on-site. All surveys reported being offered in Spanish and English. No companies surveyed reported other languages utilized for coffee tours than Spanish, English, and French, of which 5 reported offering coffee tours in French.

Demographics and coffee tour characteristics
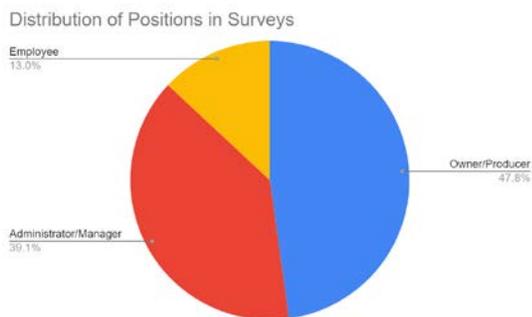
Distribution of Surveys by Province

Distribution of Positions in Surveys
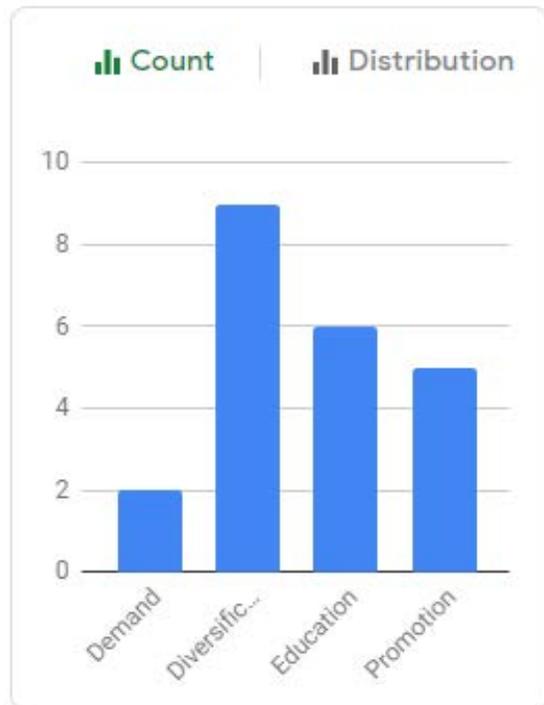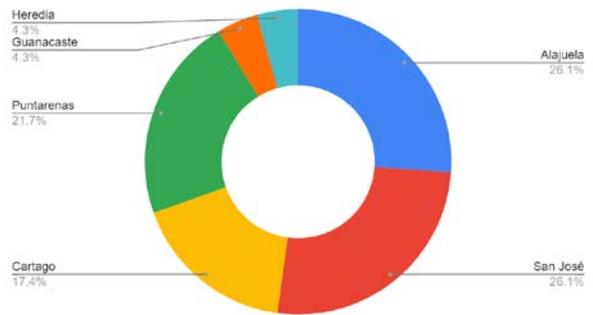
The hierarchical cluster analysis was utilized with the Ward method and Gower's General Coefficient measure (Ward, 1963) and found three distinct clusters based on four chosen variables: the number of years the company has offered coffee tours, the total number of selected offerings on coffee tours, the total number of amenities selected in addition to the coffee tours, and the total number of media platforms selected that are utilized by the company. The three

groups were found to be statistically significant.

Cluster Analysis: Group 1 (Red), Group 2 (Blue), Group 3 (Yellow)

Ward
Distance: (Gower Coef (sqrt(1-S)))
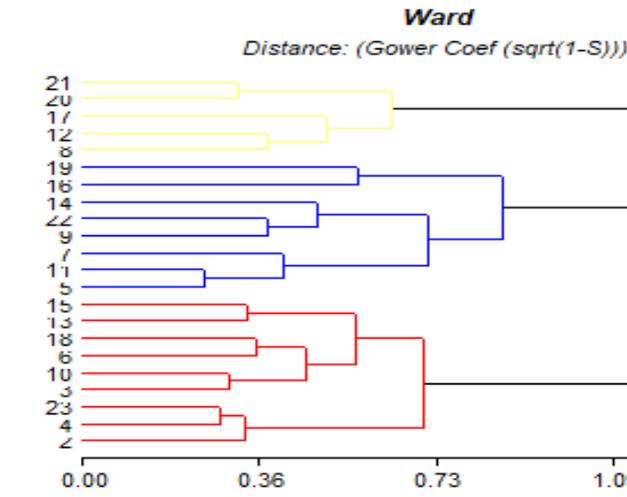

```
Analysis of variance table (Wilks)
 S.V.    Statistic  F    df(num) df(den)   p
Cluster     0.06 11.79      8       32  <0.0001
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Analysis of variance table (Pillai)
 S.V.    Statistic  F    df(num) df(den)   p
Cluster     1.43 10.54      8       34  <0.0001
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Analysis of variance table (Lawley-Hotelling)
 S.V.    Statistic  F    df(num) df(den)   p
Cluster     6.95 13.03      8       30  <0.0001
```

Based on the analysis of the clustered groups, the researcher was able to characterize the coffee tours in three distinct groups: Ripened, Perennial, and Green and Growing.

Ripened

This group (3 - yellow) contains 5 companies. They contain the highest average number of years that the company has been providing coffee tours at an average of 20 years. This group had the highest selected amount of what is learned on the coffee tours, an average of 11. This group also had the highest total number of additional amenities and offerings provided, at 12. This group had the highest number of social platforms in use, an average of 8 selected. Based on the variables utilized in the analysis, this group has been offering coffee tours the longest, offering the most on the tour, offering the most additional amenities for visitors, and the highest potential reach of visitors with the greatest number of social platforms. It is inferred that this group is the most developed and at full-scale operation. This group might have been keeping up with the tourism demand as tourism increased since the 1990s.

Perennial

This group (2 - blue) contains 8 companies. The group had the middle average number of years that the company has been providing coffee tours, at an average of 14 years. This group contained an average of 5 selections for what was learned on the tour. The group recorded 9 additional amenities available and 5 social platforms utilized. These companies have been providing coffee tours long enough to be developed, but may not have the required resources to improve and enhance their tours. These companies could be run on a small, but still offering what tourists desire and demand.

Green and Growing

This group (1 - red) contains 9 companies. This group had the lowest

average number of years that the company has been providing coffee tours, an average of 6 years. However, the group averaged 9 selections of what is learned on the coffee tours. The group offered an average of 9 additional amenities available and 5 social platforms utilized. Although the youngest group, these companies offer just under the Ripened's group number of what is learned on the tours. These companies have had less experience in the number of years offering coffee tours, yet offer the same additional amenities and utilize the same number of social platforms as the Perennial group. It is inferred that this group of companies is keeping up to date with online platforms and additional amenities for its visitors.

Implications

Findings show three distinctive types of tours: ripened, perennial, and green and growing. This offering of tours, we argue here, is not easy to distinguish by the tourist especially since we did not find a correlation between the type of tour and the price paid for it. Careful consideration must be given then to the expectation created around the coffee tour by the tour operator and/or agency that booked the tour. Said that the findings clearly describe the spectrum of coffee tour experiences in Costa Rica. It seems like there is no barrier to entering the market since different land scales of farmers are involved in the industry. Years of operation in coffee production is not an entering barrier, either.

This research is valuable, as it distinguishes necessary information to differentiate companies providing coffee tours and their offerings. Coffee estate owners and managers would be interested in the specific typologies to differentiate the experiences that visitors demand and diversify their offerings. Coffee estate owners and managers can utilize this research as a marketing tool, promoting their businesses as what makes their coffee tours special and unique to other coffee tours. Understanding which category their coffee tour is assigned will assist these coffee estates to build on their current offering and better identify what they can do to improve their offerings.

This research also assists coffee estates and their communities in establishing a greater understanding of what is needed to begin offering coffee tours as they can choose the type of coffee tours they desire: ripened, perennial, green & growing. Coffee farmers adding coffee tours to their current operations could develop a more diversified revenue stream, provide for the increasing demand by tourists, and/or educate those purchasing their coffee beans. Our finding, however, did not distinguish any differentiation based on cultural consideration or scale of production. For example, no tours focus on the traditional processing of coffee versus industrialization processing. Defining and delineating the distinguishing characteristics of coffee tours should also provide coffee farmers with clear guidelines for establishing and improving

experiential-based coffee tourism. Here a final warning should be given, most existing coffee estates have capacity limitations in space, personnel, skills, and techniques, therefore it is difficult for coffee estates to promote at a larger scale (Anbalagan and Lovelock, 2014). Having more visitors than available carrying capacity produces negative impacts (Wang, 2019)

Limitations and Future Research

During the research period, the COVID-19 pandemic was ubiquitous throughout the country. Due to the pandemic, tourism in Costa Rica was not "normal". Results recorded by companies may have been affected due to the pandemic and what is offered on their tours. Costa Rica implemented restrictions for large groups and tours were altered to minimize the spread of the disease. Group sizes were limited during tours and new sanitation and health measures were changed to accommodate visitors.

Only coffee tours found online with a website or email were contacted. Forty-four potential coffee tours in Costa Rica were found through online searches. However, not all who were approached for a survey responded. Due to the exploratory nature of the research, online surveys were utilized to gather more information from more tours and operators rather than a select few for in-depth interviews to collect as much data as necessary from as many tours as possible. With the limited time available, the research is based on the self-

assessment answers by the companies responding to the survey. As the companies self-assessed, further research would be needed to validate the responses. Further research to gain more understanding of coffee tours and typologies to develop would be utilized in conjunction with interviews and/or ethnographic studies.

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REPORT

Sustaining a Purposeful Life

Ryan Rogers & Allison McBryde

PTSD Veteran Foundation

The ripple a rock makes when it hits still water is how trauma affects an individual, their family, and society. Often, when a veteran returns home from war, the effects of any trauma aren't visible and slowly begin to unfold, dimming the light from within. Post-traumatic stress is complicated to pinpoint when someone suffers in silence. Life can become unmanageable, causing a feeling of hopelessness, often leading to thoughts of suicide. When a veteran transitions out of the military, the transition is more than just an employment change; it's a significant life change.

The PTSD Foundation of America is devotedly focused on reducing the veteran suicide rate, knowing that if a veteran has been diagnosed with PTSD, the individual will likely have 5 out of the six suicide risk identifiers, significantly increasing the risk of suicide. (Rogers, 2021) Our mission is to bring hope and healing to veterans and their families suffering from the effects of combat-related post-traumatic stress disorder (PTSD). The programs and services we provide are veteran-centric, whole-person, faith-based, and recovery-oriented. This approach includes biological, psychological, social, and spiritual components. It has been said many times, "There is no place like Camp Hope." because of the supportive staff and culture of belonging, ready and willing to help each veteran heal their brokenness and find a new purpose in life.

CURRENT SITUATION

In the 20 years since 9/11, military suicides have been four times higher than deaths in war operations. The Veterans Health Administration estimates that 22 veterans take their own lives daily. We know that this number is much greater. A

joint study from America's Warrior Partnership that included the University of Alabama, Duke University, and the DoD recently reviewed the census death data from eight states over the past five years to examine the accuracy of former military service members' recorded death records and found that a large number of veteran deaths were recorded incorrectly and did not accurately reflect the cause of death as suicide. Furthermore, the study concluded that the number of veterans losing their lives to suicide is closer to 40 a day, nearly doubling the number the Department of Veteran Affairs released last year. (Shane, 2022) This only highlights the critical task and accountability of recording a death and our collective approach to the suicide epidemic.

We believe these numbers will continue to rise. The recent American exit from Afghanistan is presenting itself to be a trigger in military personnel formerly deployed there. The continuing pandemic has also had a devastating impact on veterans and has accelerated the pre-pandemic opioid crisis. We understand that our work has only begun, and we are fiercely dedicated to saving one life at a time.
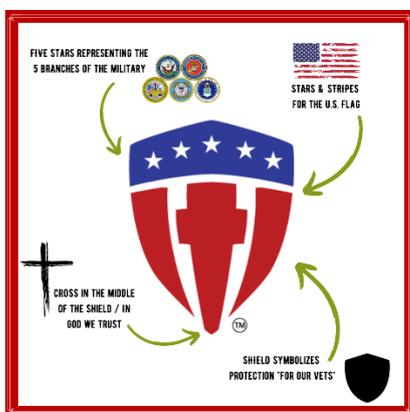
WHO ARE WE AND HOW WE GOT THERE

The PTSD Foundation of America began as a grassroots effort in 2005 with a group of concerned volunteers who searched for homeless veterans on the streets of Houston with a vision and passion for drastically reducing the veteran suicide rate through programming and outreach services. Over the years, we have remained dedicated to the mission. We have successfully grown into a nationally recognized non-profit known for assisting combat veterans and their families with the complexities of post-traumatic stress, changing the trajectory of their lives, and transforming them into thriving, productive citizens of society.

As an organization, our primary focus is on the combat veteran and family unit of support. In the beginning, the outreach efforts brought veterans together for weekly support meetings called Warrior Group. The national outreach program has now grown to include three states and five chapters serving thousands of American veterans and their families across the country each year. Our staff is trained in working with victims of trauma, addiction recovery, suicidality, and post-traumatic stress. In 2012, we established Camp Hope, a residential treatment facility in Houston, Texas. Starting as a 8- bedroom home that provided interim and transitional housing to veterans working to heal their invisible wounds, our five-acre campus now includes five housing facilities with 82 beds; two buildings for classes, worship services, a meeting facility to hold Warrior Group meetings, Alcoholics Anonymous and Narcotics Anonymous meetings; and a unit for hosting family integration programs. Since the inception of Camp Hope, the program has maintained a 24-

hour crisis line that is answered by a trained combat veteran.

The Camp Hope program has five program goals for participants:

- ✓ Completing the six-month residential program
- ✓ Overcoming addiction
- ✓ Decreasing suicide risk factors
- ✓ Acquire coping skills for everyday living
- ✓ Attain a source of hope, forgiveness, and healing for themselves and their families

The Camp Hope program has been helping combat veterans for over ten years. A typical program journey lasts anywhere from five to eight months; every person is different. The mentors at Camp Hope compassionately work with the veterans one-on-one to help them find new purpose and change the trajectory of their lives. All services are provided free of charge to veterans and their families.

WHAT SUSTAINABILITY LOOKS LIKE TODAY

Sustainability for our organization begins with the veteran. Empowering the individual and instilling effective coping mechanisms and life skills so that they have the tools needed to live a sustainable life. When a combat veteran enters the six-month residential program, he is guided through intensive evidence-based peer-to-peer mentoring, behavior modification, recovery, workforce preparation, and professional counseling with 24/7 support. Through the caring and compassion of the mentors and staff, long-term transformational change begins to take place as veterans find purpose, develop emotional connections, and become spiritually aligned.

Once graduated from the program at Camp Hope, the veteran can transition into our After-care program which promotes healthy social interactions and peer relationships through monthly team-building and recreational outings that include equine-assisted psychotherapy, horticultural therapy, kayaking, bowling, golfing, paintballing, and fishing. These activities reinforce social bonds among participants and increase the likelihood that participants will seek out engagement through our support groups.

Possibly the best measurement of success is every life that is saved. A Georgia resident and US Army veteran, James Hyun, was a combat specialist who deployed in Iraq and Afghanistan. He shared his story in a video for Southwest Airlines:

https://community.southwest.com/t5/Blog/Honoring-Our-Veterans-amp-Spreading-Hope/ba-p/132677

As we align our organizational goals with our sustainability goals, we are inspired to continue growing our sustainability initiatives. The Garden of Hope, located at Camp Hope is an example of our sustainable efforts. Our heartfelt vision for the garden is that it will be an all-encompassing, high-impact project that

will provide generational benefits to the Veteran who chooses to add this alternative therapy to their daily lives. Our program at Camp Hope utilizes various holistic interventions that encourage a growth mindset and independence toward a more empowered and intentional life. We believe the Garden of Hope will have a positive impact on the mental health and well-being of those who participate, providing the opportunity to learn how to grow in the practice of therapeutic gardening. We want to give our veterans the chance to connect with the earth and the dirt, cultivate a relationship with the garden, and begin building self-reliance at the same time. The garden has been built to provide the maximum amount of harvest the space can produce and will also be used as a The Window of Tolerance resource focuses on sight, sounds, smell, taste, and feeling. Improving health and healing through nature. The on-site Chef utilizes the vegetables harvested from the garden in the daily meals prepared for the residents and staff at Camp Hope.


WHAT MAKES US EFFECTIVE

We avoid mission creep while staying relative and addressing the changing needs of the veteran community as we address the PTSD in combat veterans and their families.

We are always looking to improve the way we approach and deliver overall care for combat veterans. If a current policy or process is inhibiting the veteran from receiving the care they need, we adjust it to meet the needs of the veteran. Recently we asked a graduate of the program what the organization means to him, and he graciously replied,

"When I think about what the PTSD Foundation of America and Camp Hope means to me, I first must reflect on how my life was before. A combat veteran from Operation Desert Shield in Iraq, I have struggled to reintegrate ever since I was discharged. I spent many years trying to live a normal life, but nothing worked. Having spent a combined prison time of 17 years… failed marriage… failed in fatherhood… and failed in life—I was ready to quit it all. My wife heard about the PTSD Foundation of America and told them my story. Someone from the foundation found me and immediately reached out. They told me there were others like me and that I was loved. They told me of a place called Camp Hope where other hurting combat veterans were healing their invisible wounds of war. As soon as I got there, I could feel the love and started healing and finding the solution in my faith. After 6 months at Camp Hope, I returned to Georgia and found the foundation waiting for me at the local PTSDUSA chapter. I attend all the Warrior Groups offered in my area. I volunteer for any opportunity to help the foundation and continue the mission to reach out to people who are suffering in silence.

The journey isn't over. I continue to heal. I continue to work towards a life worth living. Simply put—I wouldn't be here, reasonably happy and being a productive citizen, were it not for the caring people at the PTSD Foundation of America and Camp Hope." MacClean
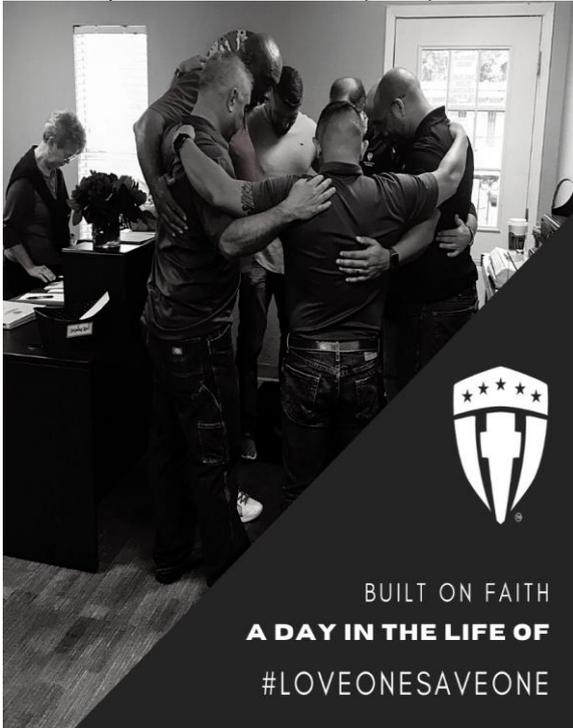
OUR SUSTAINABLE FUTURE

Looking forward through our sustainability lens, our goal is to become an organization of excellence in the programs and services we provide and create a safety net for the veteran community. Our focus will remain on improving the overall care the combat veteran receives to ensure long-term success after leaving our program. We can not do this alone and understand the value of our community partners, and their part in helping to improve the overall level of care combat veterans receive. Capacity building is a top priority, as we look to expand our footprint with additional outreach locations and residential treatment facilities located in areas where we can make the most impact.

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Consolar Aqua-Pump Team
Solar Desalination Circulation System

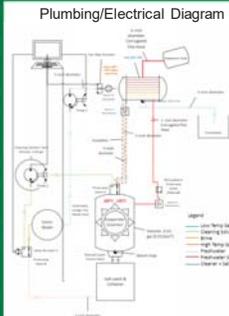Jonathan Drummond, Austin Gross, David Chamberlain, Bashar Zuaiter

Introduction

The effects of Global Warming has seen an increase in scarcity of many basic human resources, one of which that is most significant is freshwater. A sufficient solution to this is desalination, the process of separating salt from seawater by a closed system of evaporation and condensation. However, a drawback of desalination is the energy consumption required to produce a worthy amount of freshwater. Therefore, the objective of the Consolar Aqua Pump is to support the desalination system in flowing saline water through a multistage distillation process, generating power for its electronics and controlling the temperature through an autonomous feedback code. This poster will discuss the initial circulation design, simulation data and code operation outputs that were analyzed throughout the duration of this project.
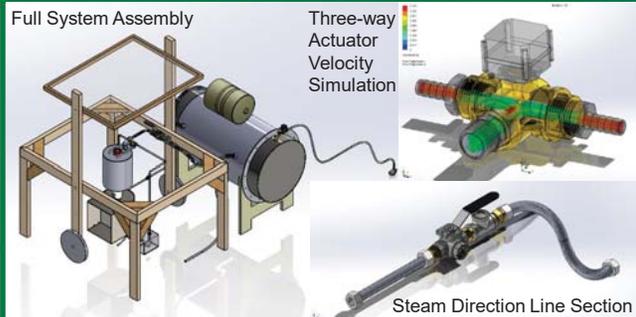

⟨Thermal Desalination Principle⟩
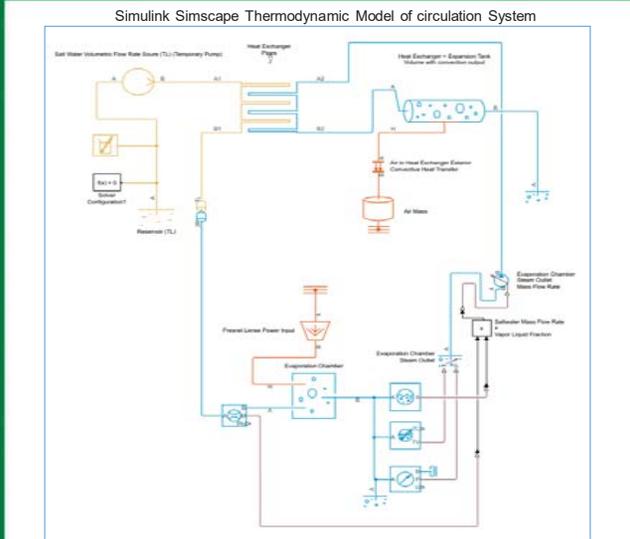
Abstract

Plumbing/Electrical Diagram

The Consolar Aqua-Pump's objectives are to promote the distillation process by powering itself, operating/monitoring its performance, and dispersing freshwater contents. By utilizing solar panels and battery circuits to power electronics we achieve a net-zero energy system. We relay on and off signals to valves and pumps between the power source and a Raspberry Pi via a feedback control loop. The control loop infers sensors' data and reacts to critical readings by isolating the system instantaneously. Finally, the temperature resistant segments connect all major components ensuring a controlled flow.
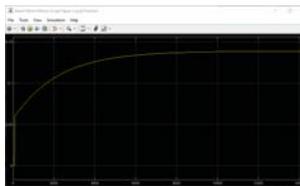
Design Models

Full System Assembly

Three-way Actuator Velocity Simulation

Steam Direction Line Section

Simulink Simulation

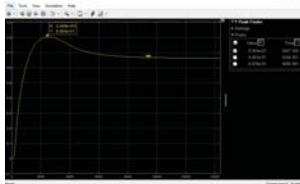Simulink Simscape Thermodynamic Model of circulation System

In Simscape, we designed a thermodynamic model around the boundary conditions of the heat exchanger, evaporation chamber, and salinity of seawater. This was achieved using a series of thermal fluid toolboxes tailored to the same volumetric flow rate (2 gal/hr), specific surface area geometries, maximum heat transfer (1000W), and initial temperature of saline fluid ($22\,°C$). The result confirmed our hypothesis when steam production increases, the amount of energy that the saline liquid must absorb increases proportionately. An increase in heat transferred to preheat the saline water allows for easy separation of freshwater vapor from the saltwater mixture in the evaporation chamber. However, the throttled volume of the heat exchanger hinders its heat absorption ability as increasing temperature reducing its heat transfer coefficient. This thereby restricts its ability to condense the steam into freshwater thus leading to a thermodynamic steady-state seen to the right. The steam production and condensation to mass ratio levels out at 13.89% and 66.32% respectively. When calculated, our simulated system produces 1 gallon of condensed, distilled water every 6 hours using no inputs besides saltwater and solar irradiation.

Steam to input saline mass ratio for 1000W input over a 4-hour period

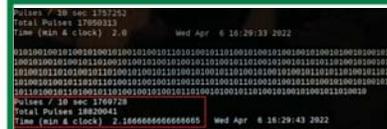Freshwater to steam mass ratio for 1000W input over a 4-hour period

Acknowledgements

Results and Conclusion

The HiLetgo flow sensor was calibrated by counting the number of total pluses emitted to the Arduino over a run time period. Each pulse is represented by a "1" while a "0" is a count between pulses. There are 6.235E07 pulses received per one gallon of water displaced as our standard proportion ratio. The results above counted 18820041 pulses over a 10 second period equating to 0.0301 gal/sec. This measurement is accurate because the constant flow rate of our pump displaces 0.035 gal/sec. Occasionally, the voltage supplied by the raspberry pi was too weak to transit through the length of wiring ensuing lack of received data.

The Otomatico temperature sensor probes displays readings in Fahrenheit compatible with the Raspberry Pi's interface. Sensor 1 measures preheated saline water existing the heat exchanger and serves as an efficiency variable. Sensor 2 tracks the superheated vapor temperature flowing through the steam line that communicates a range of safety readings with the Arduino. Upon releasing steam into the condenser, sensor 2 reached a peak temperature of 86°F, well within our predicted range, while sensor 1 remained at a consistent 22°F.

Connecting our local residents to nature

Erin Garrett, Natural Resources, Environment, and Energy

Master Naturalists

The Illinois Master Naturalist program is a volunteer training program that provides science-based educational opportunities to connect people to nature and help them become environmental stewards.

Unit 27 has 15 active Master Naturalist volunteers this year, who are involved in numerous volunteer projects.

Master Naturalists removed over 2,800 pounds of trash from the Shawnee National Forest and U.S. Fish and Wildlife Service property in 2022.

Master Naturalists pulled 160 pounds of garlic mustard and 3,250 Japanese honeysuckle saplings. These two invasive species cause major problems in our forests if not removed.

Master Gardeners

The Illinois Master Gardener program is a volunteer training program whose mission is "helping others learn to grow". Master Gardeners provide service to their community by sharing their special interests in horticulture and the skills they acquire during training.

Unit 27 has 8 active Master Gardener volunteers this year, who are involved in several volunteer projects.

Master Gardeners assisted with pollinator garden maintenance at a partner site's educational garden.

Master Gardeners prepared over 150 herbarium specimens for the Plants of Concern program.

Master Gardeners care for the unit's two food donation gardens.

Field Trainings

Educator Erin Garrett specializes in plant identification of grasses and prairie wildflowers. She is invited often to share her knowledge during field days and webinars.

She developed and delivered a popular webinar series, Which Grass is Which? Her five-part video series had 1,300 live participants. Recordings of the webinars have received an additional 15,000 views.

Her recently created blog, Grasses at a Glance, is providing an asynchronous learning opportunity.

Erin identifying a grass at a prairie plant and grass identification training for NRCS professionals.

Erin talks about grass identification resources at a grass identification field day held as a regional Master Naturalist learning opportunity.

Nature Programming for Families

With the return to in-person programming, the NREE team is emphasizing reaching new audiences in all communities of the unit. A needs assessment showed that many residents of the counties enjoy spending time outside with their family, so new multi-generational programming is being developed.

All About Caterpillars

New in 2022, we partnered with local libraries in the 5 counties to deliver educational programs for youth. Youth learned about caterpillars while parents and grandparents received resources on pollinators, native plants, and trees. Local libraries were very enthusiastic about the partnership.

77 youth
51 adults
9 libraries

Magnificent Moths

Magnificent Moths encouraged families to learn about moths during National Moth Week. Fifty-five participants visited 12 stations to learn what a moth is, how to attract them at night, what their caterpillars look like, and more. Master Naturalist volunteers and Extension staff engaged with youth while dressed up as moths.

YOUTH CORNER

This is Life; Make the Change

By: Kennedy Moore

Human Trafficking is a perpetual danger that, shockingly, doesn't get the action it deserves. To be truthful, I didn't know much about it besides the basics of people being taken away from the lives they once knew to do sex and manual labor. I would've never imagined it to be the dark and evil web that it is, nestled into every crevice, even within my town. To truly understand, you MUST listen to those who dealt with it first hand. The pain, sadness, heartache, and emotional wear and tear are unsurmountable. When they speak, it's like it's only you and them and nobody else. I assume it to be this way because of the very real possibility of you being a victim and the realization that you're not so separated from this evil. It's critical to realize that this is a compounded issue. When pimps target girls, they look for those that are insecure, and self-conscious, those that "don't have the confidence to look [them] in the eye and say thank you" to a compliment. We also need to address the fact how generational trauma feeds into trafficking and makes it easier for the trafficker.

Generational trauma can include a slew of things ranging from drug and alcohol abuse, child neglect and abuse, and domestic violence. These girls and boys are hardly told that they are enough, that they are worthy of love, beautiful, and strong.

All they know is a family that is supposed to care for them, yet doesn't show it. As said at the UNT Anti-Human Trafficking conference, "the trauma of others dictates our actions for the future." Not to say that it is right, or should be this way, but it is undeniable to say that we as humans are creatures of habit and we simply do not know what we don't know. We fall in pattern with those we are surrounded by. Those generational traumas, especially in minority groups, fall onto us. Like chains, we are expected to bear. In this vulnerable state, those normal teenage feelings of insecurity and self-consciousness are amplified times 1000x. We begin to ask ourselves, "why did my mother not care enough for me to stop doing drugs." "He says he loves me yet he hits and abuses me." "Is this what I deserve?" To combat this issue we need to focus on Education. Not only for survivors but for those that haven't had to deal with this. Many times people dismiss the voices of those being oppressed because they simply don't understand.

Secluded by their privilege, they look at the world and assume that it's not a problem, or more scaringly, it could never happen to them or their loved ones. Again, I fell into the latter category. My benevolence and lack of education blinded me from the realness of an encounter I had.

I was approached by an adult janitor in the middle of swim practice. It was just me and him in a locker room. I tried walking away because my gut was unsettled by his presence. He walked towards me and told me how beautiful I was, proceeding to ask me how old I was and where I was from. I was stunned. I regard myself as a confident and loud person and believed that if ever in a situation like this one, I could easily stand my ground. I couldn't. I was scared, stammering quite literally. I ran. That day I went immediately back to practice as nothing happened. I thought about it and deep down I felt gross. I was trying to convince myself that I was being dramatic. I was angry because why couldn't I take a compliment? The grooming process plays on the little encounters. Traffickers look to find a need. To see what you crave and give attention to that.

Kara Doan, the co-founder of Restoration 61, talked about the strategy of a pimp she talked to. Stalking at the local mall, observing the crowds of young girls. Seeing who was pushed to the back, tugging at her clothes and hair. He finds any way to intervene. Usually "bumping into them at a food kiosk." He asserts himself by saying sorry and then proceeds to compliment her on her hair, eyes, and clothes. From there he begins to be your confidant. Slowly building trust and a relationship. Over time they isolate you from your loved ones, telling you how "they [your family and friends] couldn't understand you, but I could." Later on, the abuse sets in, at first, little things, but with the accumulation of isolation and a record of petty crimes, they're the only ones you got. We need to educate young people about their predatory behaviors. Like a lion on the prowl, a trafficker stalks its prey,

lurking in the background when you don't even notice it. I realized, then, that that man was always in the background. He always went out of his way to acknowledge me and say hi. I dismissed his constant presence and attention to causal, nice behavior and doing his job. In my head, he was doing the thing he was hired to do. I didn't know then what his true intentions were. It's truly disappointing how society doesn't protect the ones that need it. Time and time again, the government fails to ensure the safety of those that it says it will "serve and protect." Native American people are more disproportionally trafficked than any other race group. Their constant neglect is at the hands of whatever underwhelming reason. "40% of women involved in sex trafficking identify as AI/AN [American Indian/American Native]," yet natives represent only 1.3% of the US population according to the US Census Bureau. With natives living on the reservation, they have a tribal government that handles all their smaller issues on the land, but in cases of homicide, rape, and abduction, that is in the hands of the state and US government. Many speakers at the UNT Anti-Human Trafficking Conference spoke about their experience dealing with law enforcement and living on the reservation. Many times law enforcement will wash their hands clean from the issue because there are, apparently, too many bylaws, or in cases of homicide, rape, or trafficking, blame the victim because of records of running away or petty crimes, and, furthermore, would mess up the evidence, invalidating the entire case and the family of the victims never receiving justice. We search to find an explanation for this indolence, hoping for something that makes sense in light of this issue, but it's

crystal clear that the only factor keeping these victims from receiving proper action and justice is because of them being native. It is bold to assume that there are racist intentions, but it is a fact that native people have been abused, oppressed, and underrepresented time and time again, and sadly, history proves to be right again. This is an unnerving topic and it feels safer to push it aside and ignore it, but said concisely and perfectly by speaker Summer Flores, "this is life and has been for years," and the change starts with you.

YOUTH CORNER

Diving With A Purpose Final Reflection:
Summer of 2022

Gabriela Schwartz
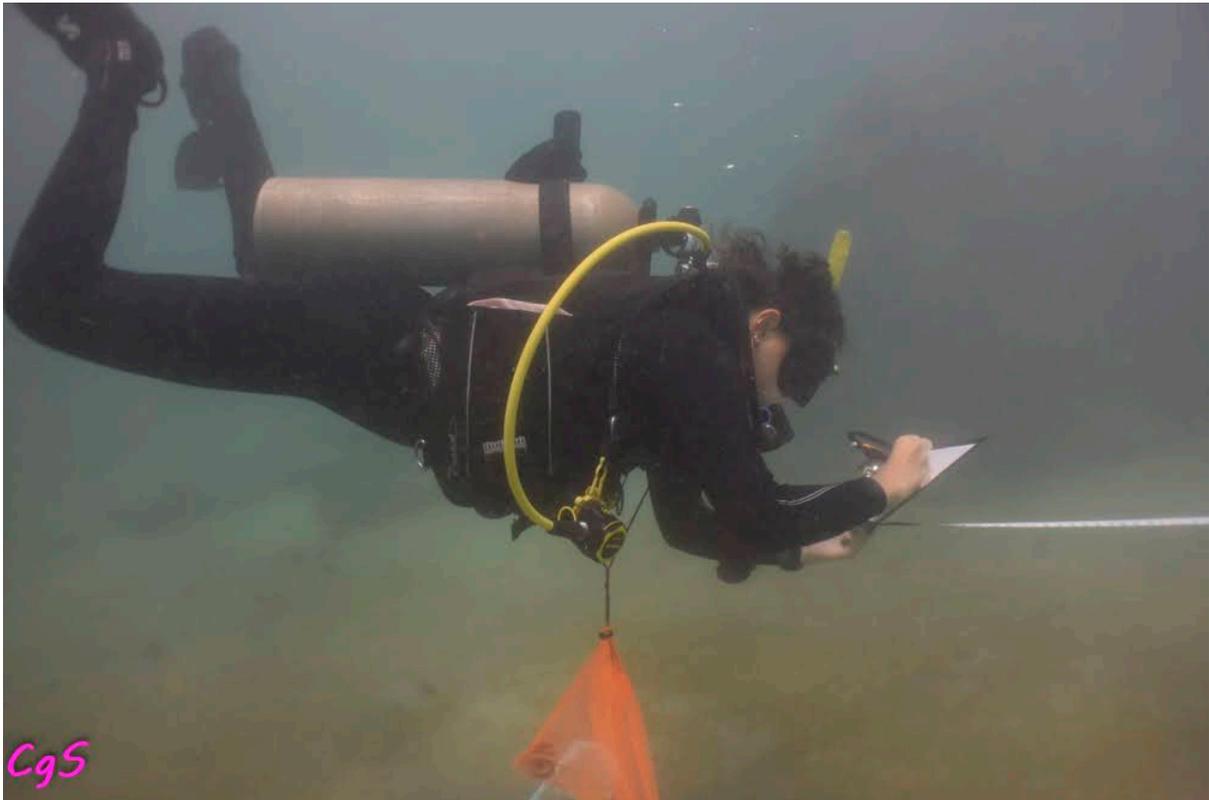
I began diving in my sophomore year of high school at the Urban Assembly New York Harbor School. Between then and my graduation, I was made aware of DWP's work by alumni of the NYHS Professional Diving Program who had been involved in Youth DWPs trips. From that point, I knew I had to be a part of it in some capacity. So, when I decided to take a gap year before attending university I immediately searched for upcoming trips. Among so many other things, this trip reminded me of why I dive and why diving is so important. When most certifications are granted through the tourism industry it's easy to forget that each breath we take underwater is an amazing privilege. Scuba provides a connection to something much larger than ourselves; the work of DWP is a full embodiment of such connection. It's been a true privilege to put on a SCUBA kit and to learn not only the technical skills of maritime archeology but in the context of real people and stories.

On this trip, we connected with our hosts Ambassadors of the Sea, and stayed in the community of Cahuita on the Caribbean coast of Costa Rica. Maria Suarez Toro and the Ambassadors of the

Sea worked so hard to make our trip go smoothly and grant us access to some very sacred wreck sites. Additionally, Maria has worked to find the ancestral history of many of her students; going to great lengths to gain knowledge about their family lineage leading them to Costa Rica. As humans, we have this innate need to place ourselves and find security in community and connection. As a multiethnic Latina born in the United States, I felt it may be impossible to find out what my ancestors had experienced. However, I leave feeling that while my lineage might not be as grand as connections to indigenous kings and queens or discovered wrecks, the information can be found.

After diving into the Brick site on one of our final days, we reflected as a group. One of the other participants mentioned that as divers in these sites, we are not only viewing the remnants of significant markers of ancestral strength, courage, and events but diving with the spirits of those left behind. The thought that they might be guiding us back to the gaps left in history and to the markers of the sacrifices they've made for us to be where we are is immensely comforting. Though there is much progress to be made in our society, I'll be forever grateful for the opportunity DWP has given me to connect with and spend time reflecting on the events and efforts of those who have fought to allow us to stand where we are today.

YOUTH CORNER

A Lesson Students Must Learn

Ramya Potula

The education system is flawed. It has failed to teach students how to sustain the Earth's resources and failed to teach students how to care for the Earth, which just happens to be their home. The education system is failing our world now and in the future. It is time we step back and assess the core problems in society, because as humans it is our job to protect our home.

Proper education for children is the key for our community to thrive because these children will be the future leaders of our world. How could we expect our world to be better if we are not teaching students what they need to know to improve the world? The only way we can upgrade the quality of our future leaders is to upgrade our education system. And by upgrade, I don't mean only providing students with the same privileges as everyone else; I mean teaching students about self-efficiency, problem-solving, and how to properly nurture our world with a deep level of care.

The youth is our future, this is guaranteed. So why do we continue destroying the future? Our education system is being solely corrupted by profit and arrogance instead of focusing on the child's education. Children are not program-based robots, they are humans who are given the important task of caring for our earth, and this can only be improved if the education system is improved as well.

One of the major problems in the education system is the lack of attention brought to people with disabilities or differences in learning styles. Some people in society often define a learning disability as ADHD or even label a slow reader with dyslexia. Students are even being held back unfairly simply because they learn differently. Although these learning disabilities cannot be completely cured, we can still provide them with proper support so they can succeed in not only school but in life. This brings up the next problem, which is the "set-up". Schools and people in charge of developing the education system rarely care if the child succeeds; they simply don't care if we make it or not. They make us feel like we failed for life. Do we want our future generations to have this corrupted mindset at such a young age? Aside from differences in learning, students are suffering from depression, anxiety, stress, and even suicide due to academic stress. And the cause of this academic stress is simply the education system. Students, unfortunately, develop these conditions at such a young age, corrupting their dreams, goals, and passions. Having these three things in life is crucial for people to make the world sustainable and a better place. Without proper education and proper care for the student's mental and physical health, these dreams, goals, and passions will simply disappear due to the education system engraving the word "failure" into these young minds. How will our world be able to improve if students are essentially being taught that they are a failure unless they are able to surpass all the standards of the education system? This is simply a chain reaction. If students are not given proper learning opportunities and genuine

education, then our future will not improve for the better. This might seem like a small thing now, but in 20 years these students who are being heavily corrupted and discouraged by the education system will carry these aspects with them for the future. We need to work to help piece back the puzzle pieces of the system because this is the first step to achieving a high quality of life.

Now that we have assessed the core problem rather than pretending everything is fine, we can come up with a solution. This problem will be solved if we include ways to improve sustainability in our education. Knowing what all the presidents did, knowing how to multiply 3-digit numbers mentally, and knowing how photosynthesis works are important, although learning how to improve our planet is truly a skill that young students must learn! If taught properly, this knowledge will carry with these children for the future therefore they can make their mark and help us grow. Learning how to improve our planet will not only teach students about energy waste, air pollution, reducing, and recycling, but also how to be self-sufficient, how to problem-solve, and how to be efficient and effective daily. How do we get all of that done?

1) By teaching students about social and economic advancements and the environmental impact these developments have.
2) By teaching students about the dangers of pollution and climate change.
3) By using our resources more smartly.

More attention needs to be brought to teaching students about social advancements, economic developments, and environmental factors. We need to help our environment and ecosystem stay in balance for us to live happily in this world. The current generation is constantly surrounded by technology and other advancements, and it is this generation who can use these advantages that others may see as dangerous, to our favor. We have the power to make change faster through how much humans have learned and evolved, although nothing can be completed unless we are taught about sustainability and the connections it has to a human's existence.

People are always saying our generation is a lost cause, although I see our generation as a new group of individuals who can and will help further grow our earth smartly and safely. All we need is a real and honest education on this topic that has been in hiding for many years. Teaching students about the dangers to the environment such as pollution and climate change, not only will affect the development of the atmosphere but the development of humans as well. Just by simply learning the basics of the dangers of pollution, climate change, and toxic resources in our world, students will begin to stimulate an interest in maintaining a healthy environment. As humans, we need clean air to breathe, but through these toxic habits society has adopted too, we are infusing our bodies with toxins that can severely harm us and our future generations' physical health as well. Our health is the direct result of the environment's status, and it is about time children are aware of this.

The smarter we use resources and understand the problem and solution behind current world problems, the more we will help our world become sustainable.

Students must learn the value of our natural resources, not just what they are. We know water, sunlight, minerals, and air are natural resources, but have students learned how to properly protect these natural resources and use them to improve the lives of humans? We need to create quality communities and learn about ways to support our natural environment permanently. What are the chances students know that LED bulbs consume less electricity than regular light bulbs, that car gas releases 1.7 kg of carbon dioxide into the atmosphere for every 10 kilometers, or the number of benefits eco-friendly products do to the environment, or even how covering the pot of the stove with a lid when cooking can save up to 25% of energy? These are very specific, but students must be able to think critically about these daily tasks in life and think of ways to improve their tasks while helping our community. We need students to start thinking about their actions at a young age so their future will be filled with new, effective ways of sustainability. We need to start thinking smarter, not just for us, but for the people who will come after us.

Students are not simply programmed robots to follow the same course as the past generations. It is our job to implement those skills and to help the community and world grow into a better place to live for all. And this can only be achieved through improving our educational system and providing real learning to our future leaders, rather than treating children like programmed robots. I cannot stress enough the importance of incorporating the education of sustainability into a child's learning course. The amount of benefits that would   follow will truly

help develop and shape communities that our homes and earth will thrive on. This by any means is not a small task. In fact, it will take decades upon decades with millions of people collaborating, but with proper early education, this goal will become a reality. This simply is not a project where every country is by itself. This is a project in which everyone can join forces on a project in which everyone can have the same goal. However, this goal can only be created if the youth are aware of how much a human's role can harm or change their world.

It is the future generations' role to acknowledge the stereotypes and choose whether to follow them or not. And these decisions can only be made properly with genuine and raw education on how our world works.I am not blaming students. I am not blaming teachers. I am not blaming adults.

My sole goal and purpose is to bring attention to the core reason why our world is not improving as much as it could. This starts with educating the youth, and we must know how much humans need to care for the earth, we need to learn what helps and harms the earth, and we need to know our responsibilities on this earth are not only to make money, but to help our present and future be a healthier, safer, and a sustainable place to live in. It is the youths' responsibility to create a better world for us without destroying it first. Students must be aware that they can make changes. They have the power to provide greater opportunities for humans and the planet, we just need the courage to make this change. Earth gave us all a home, and in return, we must protect it; this is a lesson all students must learn.

YOUTH CORNER

I'm Enough: This Is My Indian Heritage

Thanvi Nimmagadda

I'm not good enough, in what sense? Is it my fairly larger ethnic nose that feels to not fit my face shape, or is it the stomach that slightly droops over my body? I'm a 16 year old tan-skinned, Indian woman that is 5 foot 5 ½ inches and approximately 123.8 pounds, and yet that is not good enough for other people. Other people, specifically meaning, the Indian aunties and uncles with high, unhealthy standards. This discernment is completely hypocritical considering that it's even demeaning to them as we share the same features; if they just looked into the mirror, they would simply see the proud remnants of being an Indian. But, how do we define these unhealthy standards? There's this specific image that we women have to follow, and if we don't fit this spitting image, then we're automatically discouraged and highly judged for looking how we are, rather than what we're supposed to look like. It feels like two hawk eyes are watching our every step, every move, and if one foot goes wrong then we're getting a two-hour life talk of every single thing we can do better on. From the second we're born, we've been the target point for discrimination from everyone, including people of our own.

There is this stereotypical idea that is set as our role for the rest of our lives, and that is to grow up to learn how to cook and clean to take care of our future husbands and families. Sure, times have gotten a little better, and that social stigma is slowly wearing out, but it doesn't mean that it's one hundred percent gone, and looking logistically, it will never truly be gone. Times will never really change, and generations down the line, women are still unfortunately going to have to go through what all of us Indian women are today. We still to this day grow up with the thought of having to be a "traditional" woman or else we feel unworthy of following marriage and having a family life. When looking for marriage in our Indian culture, what is on the checklist? Fair skin tone, knows how to cook, knows how to clean, needs to be devoted to her husband, doesn't need a job, needs to be extremely religious for Hindu rituals, etc. Principles as such are completely unfair to what Indian women bring forward and are atrociously demeaning to discourage our hopes and dreams. "Be more shy, be more religious, don't be loud, don't be a rebel, don't go out in the sun or get dark, don't go out at night, don't wear that, don't drink this, don't question so much, don't use your phone so much, and don't do the things the boys in the family still get away with doing," says IndianExpress, in what sense do us, Indian women, have any control over what we do and what we say?

There have been century-old history novels of chapters and chapters dedicated to what being a "good" Indian woman looks like, however, a more realistic

description is how one embodies her essence in her skin and is genuinely a superior daughter, mother, and wife to a man who respects her. As young girls like me, having that idea to bloom to be this specific way is completely demonizing, and is enough to ruin the childhood experiences we so wish to have. Being a young Indian girl, what a primetime to live, right? Wrong.

Currently living through what it's like, it's a time where we only have ourselves, we only know our true and pure selves. We hide behind this mask to make our parents happy, our relatives happy, and everyone around us happy, but are we happy? The discomfort of being someone we're not slowly building up until these young girls start to rebel. By rebelling, it means not having a loving, open relationship with our parents, and having to find that comfort in other people to feel okay. Sneaking out at night, saying you're going somewhere but going elsewhere, lying about grades, and wearing a hoodie over a crop top to take it off after you leave the house are all simple activities these young girls have to do to feel free. Also to mention how loved ones will cleanly cut your diet to make sure your weight is a certain number, or your body is a certain figure shape. Every day, the one consistent thing that is said in the household is, "Why are you eating that? You will gain weight" or "You're becoming too thin, you need to eat more." Statistically, over 25% of Indian women deal with eating disorders that deal with binge eating, purging, and even over-exercising. Not only does this affect physical, but also mental state. Over time, confidence only wanes and takes over our minds and soul because we feel like a disappointment. Sometimes, it truly feels

like a burden to be an Indian woman.

Indians, in general, typically believe that men should play more important roles in the home than women. Nearly two-thirds of Indians agree with the idea that a wife must always agree with her husband, and about nine out of 10 agree that this is true. According to a survey, which was conducted in the past two years, Indian women are just "somewhat less likely than Indian men" to say they agree that wives should always obey their husbands. Gender equality is a topic that India has been battling for centuries now, and sexism along with domestic abuse for women is considered one of the highest in India. Numerous cultural obstacles prevent women from advancing in society. Only a few examples include discriminatory family norms, a lack of education, and cultural stigmas. The government is under increased pressure as a result of increased media attention to these injustices to change how women are treated in institutions as well as to advance the conversation on women's rights in a fast-modernizing society.

I want to go to medical school and become a doctor, I want to travel the world and cliff dive in Europe while experiencing new things before settling down, I want to enhance my colored skin beauty by starting a skincare line that specifically cares for people of color. I will NOT have these old-world ideas bring my ambitions down. I will NOT allow for the mindset and attitudes of other people to not let me live my life to the fullest. If I'm seen as disrespecting the Indian culture for not following their contract, then so be it because in my heart I know that there is no such thing as that anymore. Not just me, but millions of other girls that have the

same dreams as I do, and our goals shouldn't be stamped down just to have a man live the life he wants while our only job is to make sure he's accomplishing it. There is no rulebook of what being an Indian woman looks like in our modern-day age. That old rulebook is expired and very much outdated, as we can build a new one that achieves comfort for all women.

This isn't the nineteenth century anymore, times have changed, and so have women. If the world can grow new advances that accommodate everyone, then I think the world can grow to accept that Indian women are more than just dolls for people to mess with.

YOUTH CORNER

Comparing Nutrient Pollution, Nitrogen and Phosphorus, in Yucatan Peninsula Sinkholes from 2018-2021

Dayani Davilla, Environment and Geography, University of North Texas (primary student)
Vanessa Vazquez, Environmental Science, Vassar College (student)
Melissa Lenczewski, Department of Geology and Environmental Geosciences,
Northern Illinois University (Faculty Mentor)
Kenneth Voglesonger, Department of Earth Science,
Northeastern Illinois University (Faculty Mentor)

Sinkholes serve as the major supply of potable water and are important tourist destinations in the Yucatan Peninsula. Tourism and recreational activities surrounding sinkholes, in conjunction with improper wastewater treatment, can lead to nutrient pollution from nitrogen (N) and phosphorus (P). Nutrient pollution in the water consumed from these sinkholes can lead to detrimental effects on the population. Further, changes in levels of tourism due to COVID-19 provide opportunities to analyze and compare pollution during the 2018-2021 time period which witnessed a drop and subsequent resurgence of tourism. We analyze three sinkholes: one that is primarily used by tourists from Cancun, another by the local population, and one that is not used recreationally to identify the following sinkhole characteristics: nutrient input, depth profiles of N & P concentration, and speciation (nitrate, nitrite, ammonium, phosphate).

Then, we quantify and compare these characteristics with calculated equilibrium values obtained from chemical and physical parameters (pH, total dissolved solids, oxidation-reduction potential, temperature, dissolved oxygen, and major anion/cation concentrations). We built a thermodynamic model to determine when nutrient input is polluting the sinkhole. Equilibrium values of nutrient pollution concentration in sinkholes can help detect potential sources of contamination, which could help local authorities and tourists in pollution risk control.

YOUTH CORNER

Summer Camps in UNT

Robbie Ma, 8th Grade at Carterville Junior High School, Carterville, Illinois

At the University of North Texas (UNT), there is a program called Elm Fork Education Center and they have summer camps. There are a lot of different summer camps to choose from, and all of them have something related to the environment and science. It also has a lot of different fun activities and not just a boring camp to teach people about protecting the environment all day.

For example, there is a camp where we got to learn about the different properties of water and how to test for them in lakes, rivers, and streams. There are 2 teachers, both are volunteers, they taught us about pollution in the water, and how scientists are trying to solve that. This is related to the environment because we got to learn how bad the pollution problem is in the waters and how we can help stop that.

We also learned about how to measure different properties in the water, for example, the most complicated one was measuring the oxygen levels inside the water. If the oxygen levels are high, then it is good for the organisms living inside the water; if it is too low, then it is bad because the organisms may die due to the lack of oxygen.

We used a lot of different chemicals to measure the oxygen levels and it has a lot of different steps so we can know how to determine if a body of water is suitable for water creatures. We also measured how many particles were in the water, so we grabbed a sample water bottle, filled it up with the water, and measured it with a tool that showed the temperature, electric currents, etc.

We also measure the wind speed and canopy cover for more information. We went out to measure for 3 days, one was at Ray Robert Lake which had a river there, we measured the things in the water and then we caught fish. Another time was at Clear Creek, where we did the same thing, but I fell into the creek though, I got soaked, lost my socks, and got my shoes covered with mud. The last time we went out was when we had fun kayaking, it was my first time kayaking and I found it very tiring because you had to paddle hard to get the kayak going. All in all, I think it was really fun because we didn't do that much boring work, most of the time we just had fun and it also taught us about pollution, and it teaches us to know the water environment's properties and that could let

us know if there is anything unusual going on inside the water.

Another example is that one of the camp's themes is the elements of art. We learned how to make paper from recycled materials, and it can help recycle used paper to make new paper and then you can paint on it, it is very cool. It also can help reduce paper waste.

We also learned how to make different art materials like pastels, and we used a technique called wood-burning. The only materials we needed were a wood board, a magnifying glass, and the sun. We first use the magnifying glass to point it at the sun and then make it so that it is at the right angle, and then we must point it at the wood board, and then it should catch on fire and then it will make a scorch mark and you can use those markings to make a drawing.
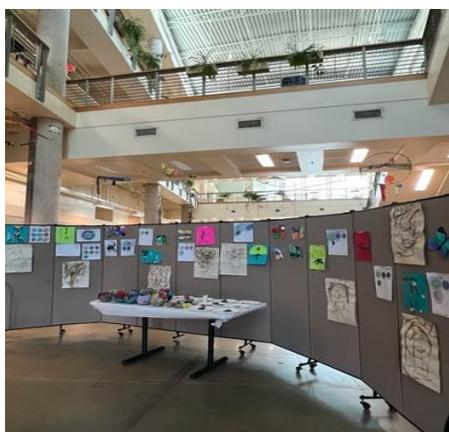
I think the camp is very fun and I think it has a lot to do with the science and the environment. I got a chance to talk to the center director Brain and learned a lot of information from the talk. Brian told me that the camp first started in October 1998. At first, there was not a lot to choose from, and there were only 40 campers over 2 weeks. But then people started making suggestions about what camps they should do and as long it had science included in it,

they'd add it to the selection, and now there were more than 200 campers over 5 weeks.
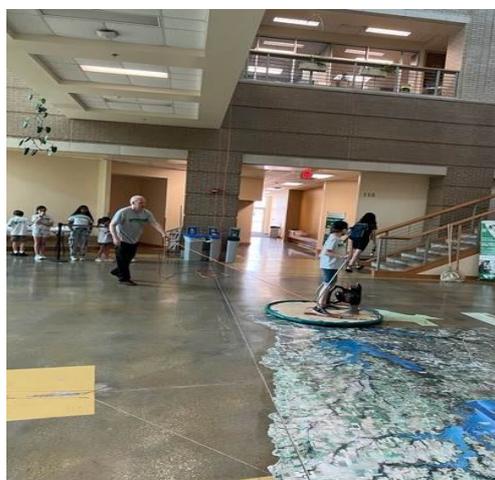
There were a lot of people who were involved at the start of the camp, one of them was Brian, and the person who got the idea of starting this Elm Fork program was a biology professor in college, how he got the idea was that he noticed the students were less connected to the environment, most of the kids grew up barely going outside. He didn't like that, so he wanted to make kids more interested in science and wanted them to go outside more. So that was why he made the Elm Fork program. Brian also told me that the Elm Fork program is not just the summer camps, there is a homeschool lab, a program for Boy Scouts and Girl Scouts, and a field trip program. Each year a lot of the volunteers are also students, and the students teach and look out for the kids, there were elder volunteers too, one of the oldest is over 100 years old!