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A Qualitative Inquiry into Collecting Recyclable Cans and Bottles as a Livelihood Activity at Football Tailgates in the United States

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Abstract: The deposit refund program for the return of beverage containers in some U.S. states has led to recycling as a means of earning income. Michigan's 10-cent aluminum can and bottle refund, which is the highest in the U.S., makes recycling for income particularly attractive. This study explores the factors that enable or constrain the livelihood activity of people who collect cans and bottles at football tailgating parties, focusing on the motivation behind choices and the factors that enhance or constrain their activities. Maximum variation (heterogeneity) sampling, a purposeful sampling method, was used to recruit participants from different races, genders, and age groups. Data were collected through direct observation and semi-structured interviews and analyzed using thematic analysis. The findings indicate that the income from this livelihood activity was an important survival strategy for those who engage in it. Other significant sources of motivation include contributing to environmental stewardship and recognition for doing so. Differences in capital assets such as social networks, physical strength, skills, and access to equipment led to differences in people's ability to earn income from collecting cans and bottles. Some challenges restricted their activities, including accessing shopping carts and public buses to transport the cans and limitations imposed on the number of cans that canners can redeem at the redemption centers.

Keywords: livelihoods; informal recycling; bottle bill laws; football tailgates

1. Introduction

In some parts of the global North, the "bottle bill" or "container deposit law" requires a refundable deposit on beverage containers to ensure that the containers are returned for recycling. Such recycling policies in the global North have had an ecological focus, with limited interest in social and economic opportunities for the urban poor [1]. Other scholars [2] maintain that waste has mainly been tackled from an engineering perspective in the global North without an integrated view that addresses social and economic concerns in resource recovery.

In Michigan, aluminum cans and bottles are recyclable with a 10-cent deposit refund monetary value at the retail level, which is the highest among the 10 U.S. states with a bottle bill. The bottle bill law has created an opportunity for people to earn income by collecting empty cans and bottles and returning them for the deposit. This activity of collecting returnables with a deposit value is becoming common in the global North [3] as it provides an opportunity for vulnerable individuals to earn an income. Some of the literature refers to them as informal recyclers. In Michigan, however, locally they are known to each other as "canners" as they collect aluminum cans and bottles and redeem them for a deposit refund. They are referred to as canners or informal recyclers in this article.

Informal recycling has become popular during college football tailgates in Michigan. Football tailgates are events in which football fans party outside the stadium before and during college and

professional football games in the United States. Such spaces generate large amounts of aluminum cans and bottles which, in states with a bottle bill, are a source of income for those who collect them. Numerous scholars have focused on understanding tailgaters' pro-environmental behavior, fan engagement through green game days, and improved access to recycling facilities [4,5]. There is a need to increase the visibility of informal recyclers in the global North so that their activities remain "socially desirable, economically viable, and environmentally sound" [6] when engaging in canning as a livelihood activity. To improve the livelihoods of canners and make it more sustainable, policies that increase their capacity to engage in their livelihood activity need to be considered. However, little is known of the livelihood opportunities that football tailgates create. To our knowledge, no prior studies have examined the experiences of canners and the factors that facilitate or constrain their engagement in collecting aluminum cans and bottles at football tailgates.

This article explores the livelihood activity of people who collect aluminum cans and bottles as a source of income at football tailgates in Michigan. The study used a modified sustainable livelihood approach as a foundation to understand factors and processes that influence canners' livelihoods at football tailgates. This study is important because it presents an opportunity to understand what motivates people to collect cans and bottles at football tailgates and the challenges they face in their livelihood activity. Qualitative data from direct observations and semi-structured interviews are used to document the livelihood experiences of canners at football tailgates. This study addressed the following questions:

1. What factors motivate canners to engage in collecting aluminum cans and bottles at football tailgates, and with what outcomes?
2. What are the opportunities and constraints that influence livelihood activities of people collecting aluminum cans and bottles at football tailgates?

2. Recycling as a Livelihood Activity

There are many news articles about people earning income from recycling in the U.S. [7–10], but there is hardly any academic literature on this issue. Although some research has been carried out about informal recyclers in the global North, there is little we know about people who collect recyclables as a livelihood activity in the United States. To date, a few studies from Canada, some states in the U.S., and several studies from the global South have demonstrated the importance of informal recyclers and the challenges they face to access resources that enable them to engage in recycling as a livelihood activity. This section explores findings from the literature on how informal recycling provides a source of income to vulnerable populations, strategies adopted by informal recyclers to engage in their activities, and the various roles of informal recyclers.

To begin with, informal recycling provides employment opportunities and a means to improve the well-being of marginalized individuals or social groups [11,12]. The few studies in North America indicate that the informal recyclers are likely to be immigrants or homeless [13], unemployed, and some may have limited or no social assistance, which motivates them to engage in this livelihood activity [14]. Due to limited literature, we are not sure whether these are generalizable characteristics of informal recyclers. The income from informal recycling is the sole source of income for some individuals, while for others, it supplements other sources, including seasonal employment, social assistance, or social benefits [15].

Moreover, income from informal recycling activities is highly dependent on one's ability to access the recyclables and other resources to be able to engage in this livelihood activity. A study of informal recyclers in Vancouver, British Columbia, highlighted that the local laws prohibit retrieving recyclable materials from trash bins, which hampers informal recycling livelihoods [14]. However, informal recyclers, or "binners" as they call themselves, have formed a Binners' Association, and they have developed a "Binners' Code" to guide their livelihood activities in Vancouver. This guide aims to legitimize their activities and to instill public confidence for easy access to recyclable material. Despite such efforts to legitimize informal recycling, a later study carried out in 2013 indicated that informal

recyclers in Vancouver still face challenges in accessing recyclable materials and other resources like public spaces, which negatively affects their livelihood [16]. While these studies have concluded that inclusive public policies will help facilitate access to recyclable materials, other services and resources [3], there is a need for more context-specific studies to guide policy on informal recycling livelihoods in developed countries.

Studies in various locations have found that informal recyclers support socio-technical systems for managing waste; they have a role as economic actors, political actors, and drivers of social change [17]. Informal recyclers are involved in removal, recovery, transportation, and value aggregation of recyclables in some cities, and they provide a service to the local urban spaces. Thereby, they contribute to the socio-technical system for managing waste, as in the case of informal recyclers known as the "Zabbaleen" in Cairo, Egypt, who have created one of the world's most efficient resource recovery systems [18]. Despite the ecological modernization of waste management systems in the global North, recyclers who earn income from their activities have remained significant in the resource recovery value chain in developed countries [19]. For example, "professional recyclers" in California have helped to raise the amount of recycled material by a great deal [13]. Hence, developed countries need to recognize or integrate informal recycling with formal waste management systems [20].

Informal recyclers are economic actors and, in some places, drivers for social change. Informal recyclers are economic actors as they depend on informal recycling as a source of income as they create opportunities that may not have existed otherwise [14]. However, informal recyclers face marginalization and stigmatization that create obstacles to their livelihood activities [2,21]; in some cases, they experience police harassment as their activities become prohibited by law [3]. These negative experiences have influenced informal recyclers to be drivers for social change [3,14,17]

The role of informal recyclers as drivers of social change is evident in the global South [17]. The informal recyclers have been mobilizing inclusive and integrative policies to gain recognition for their importance and secure livelihoods [22]. A considerable amount of literature in the global South demonstrates how informal recyclers have self-organized into membership-based organizations such as cooperatives, associations, unions, community-based organizations, or micro-enterprises to further their drive for social inclusion [17]. For instance, some of the informal recyclers inclusion programs in Latin America have recognized informal recyclers as contributors to employment creation, reduced environmental damage, and reduced landfill costs [23]. In the case in Vancouver cited above, a resource recovery and social enterprise called United We Can (UWC) has contributed to the social inclusion of informal recyclers and economic development [14]. Such self-organized organizations empower informal recyclers by advocating for improved incomes, working conditions, and social inclusion.

To understand the experiences of informal recyclers, the sustainable livelihood approach was used to study the livelihood activities of informal recyclers in Victoria, Canada [3], and in Dhaka, Bangladesh [24]. There are similarities in these two case studies, despite their geographic differences. The studies indicated that the informal recyclers draw their livelihood activity from human, financial, physical, and social capital assets, and that access and use of these capital assets differ among recyclers. Both studies demonstrate that informal recyclers are marginalized and stigmatized because of their low-income status and the nature of their livelihood activity. Both studies used participatory approaches to explore the livelihood experience of informal recyclers.

Despite the similar livelihood experiences of recyclers in Canada and Bangladesh, they also have different experiences. The study in Canada identified health aspects, homelessness, and drug abuse as socio-economic determinants that influence informal recycling as a livelihood activity. On the other hand, the Dhaka case study was not explicit about the context that influences informal recycling as a livelihood activity. The Canadian study suggested that resource recovery is a strategy that can enhance the livelihoods of informal recyclers through developing inclusive waste-management policies [3] for informal recycling [24]. These similarities and differences call for context-specific studies to understand the experiences of informal recyclers.

3. Modified Sustainable Livelihood Conceptual Framework

The sustainable livelihood approach (SLA) has been used in the two case studies above, but there are no studies in the U.S. that have used this approach in informal recycling. The sustainable livelihood approach analyzes the lives of the poor around factors that constrain or enhance their livelihood strategies [25]. Livelihood activities are pursued within the vulnerability context and structural processes that influence livelihood outcomes [26,27]. Livelihood activities are dependent on people's access to different types of capital, as mentioned above. In addition, there are mediating factors that include policies, structures, and power dynamics that influence access to different types of capital.

A modified sustainable rural livelihood framework (SRLF) [26] was used (Figure 1) to contextualize and evaluate canning as a livelihood activity at football tailgates in Michigan. The modified framework conceptualizes specific factors that enhance or constrain people's ability to pursue canning as a livelihood activity. In contrast, the original framework typically focuses on all the activities that together support a person's overall livelihood. The SRLF consists of five main components, namely (1) context; (2) access to livelihood capital assets; (3) policies, institutions, and processes; (4) shocks that enhance or interfere with the activity; and (5) outcomes. These components, described in detail below, are essential in understanding the opportunities and constraints people face when engaging or attempting to engage in canning activities. Cans and bottles are a central resource that enables canning activities though they do not fit neatly in any of the SRLF components.

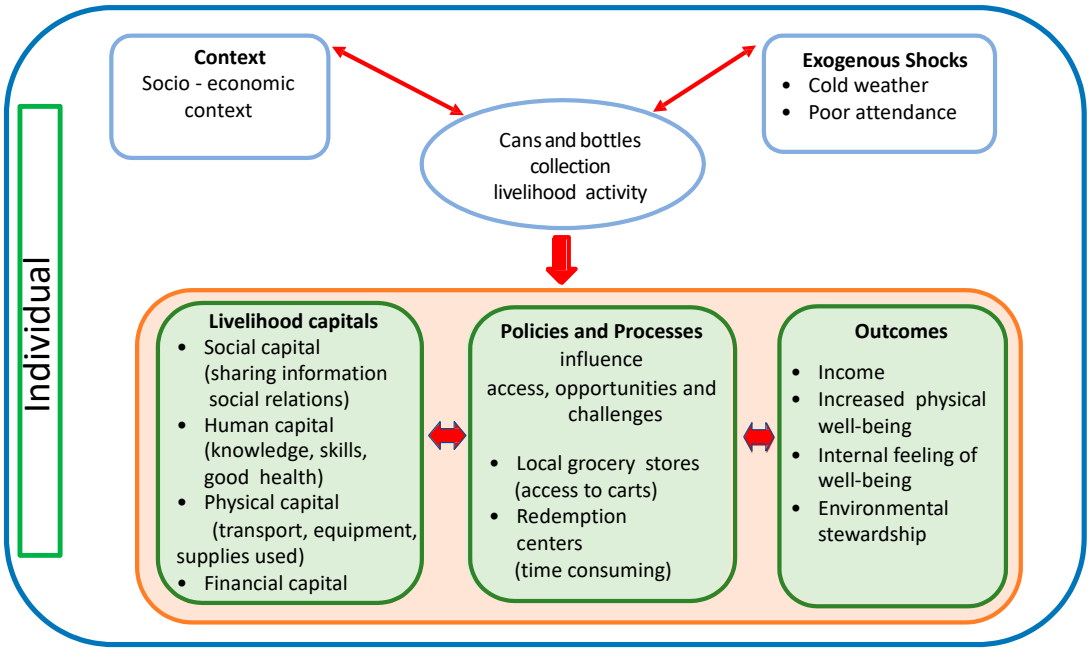

Figure 1. Conceptual framework explaining engagement in canning as a livelihood activity. Adapted from reference [26].

Understanding the contextual background of people who collect cans and bottles at football tailgates is essential. The context and conditions in which people are situated determine their ability and desire to engage in specific livelihood activities [26]. The background can be characterized by factors that include personal socio-economic and physical conditions, personal historical experiences, and policy and regulatory settings. For instance, social differentiation in terms of income, gender, homelessness, ethnicity, and immigration status tends to characterize informal recyclers [3,13,28]. The need for extra income, unemployment, and homelessness may influence canning livelihood activities.

Livelihood capital assets are the different kinds of resources available to individuals. Identifying the assets that canners have provides an understanding of resources that enable or disable people to

collect cans and bottles at football tailgates. The framework recognizes that gaining access to, using, and combining these assets is pertinent to engaging in canning as a livelihood activity. The SRLF asserts that people have five types of capital assets (i.e., social, human, physical, financial, and natural capital), which they combine to pursue livelihood strategies [26,29]. In this study of an urban livelihood activity, natural capital is less applicable [24], and, thus, we excluded it from the modified framework.

Social capital is a resource that entails social network support and reciprocity that exist between individuals and within their communities [30]. The interactions among different actors influence access to cans and bottles and other capital assets. Human capital assets refer to knowledge, skills, and good health that may allow canners to engage in canning as an income-earning activity. Physical capital refers to services, equipment, and supplies that canners require to support their livelihood. These include access to and use of transport services, shopping carts, and trash bags that enable canners to collect cans. Financial capital entails access to money from their savings or other sources of income.

Policies, institutions, and processes are important in shaping access to capital assets and outcomes of any livelihood activity or strategy [31]. Local policies and practices influence canning livelihoods in two main ways. Firstly, local policies and practices determine access to livelihood capital assets. Secondly, they present opportunities and constraints to engage in a livelihood activity. There are policies and practices by the local grocery stores, redemption centers, and the public transport service that facilitate or hinder canning activities.

There are exogenous factors that influence the viability of canning as a livelihood activity. It is vital to explore how these exogenous factors influence the sustainability of livelihood activities of people who earn an income by collecting bottles and cans. For example, football tailgates are seasonal from late August to late November. Poor weather affects attendance, and consequently, it reduces the volume of cans that can be generated. Furthermore, people's ability to work under cold weather may influence the dynamics of canning activities.

Lastly, people engage in a specific livelihood activity to achieve specific outcomes. Potential outcomes discussed in the literature include things like increased income, reduced vulnerability, improved food security [29], improved self-esteem, increased happiness, and more physical safety [32]. Income, physical well-being, internal feeling of well-being, and environmental stewardship can be achieved through canning activities. However, the livelihood outcomes of canning activities depend on the access and use of assets and the ability to negotiate institutional processes.

4. Materials and Methods

The study was conducted during the football tailgates at Michigan State University in the 2019 season. Tailgaters are permitted to publicly drink alcoholic beverages, which generates a lot of discarded empty cans and bottles. This study employed observation and ethnography. Observation enabled the researchers to learn about the physical environment of football tailgates and how canners engaged in their livelihood activities. We observed participants in their normal environment without disturbing their interactions and activities. We used an observational guide and field notes to record what tools and equipment the canners used, how they accessed cans and bottles, and how they interacted with tailgaters. The observational data also informed the in-depth structured interview guide.

Ethnography is a naturalistic form of inquiry, and it allows an emergent research process [33]. A naturalistic inquiry means that social processes and human behavior are observed in their natural setting without the researcher interfering or manipulating the setting [34]. Researching the natural environment allows the researcher to observe first-hand experiences and hear how participants interpret their experiences [33,35].

We recruited participants through purposeful sampling at football tailgates and one of the local redemption centers. An effort was made to recruit demographically diverse participants in terms of race, gender, age, and years of experience in canning. Participants were recruited through a flyer, and those interested in participating in the study scheduled an interview. Participants were compensated $30 for taking part in the study, and the interviews took approximately 45–60 minutes. Based on one of

our campus-wide observations, we distributed flyers to 64 participants with an estimated sampling frame of 42% African Americans, 48% Caucasians, and 6% other races. Twenty-eight participants were interviewed; they were aged between 22 years to 65 years, and their earnings at any football game ranged between $20 and $200. They were 61% African Americans and 39% Caucasians. All participants for our study were exclusively low-income earners except for one participant who indicated that they collect cans for fundraising purposes.

The in-depth structured interview guide allowed us to explore similar questions among all the participants. The interview guide focused on: (1) factors that motivate canners to engage in canning livelihood activities, (2) factors that facilitate or constrain canners in their activities, and (3) their overall experience of collecting cans and bottles at football tailgates. The questions were pilot tested to improve clarity. Interviews were conducted in a location selected by the participants at either a local public library or on campus. Verbal consent was obtained from all participants before conducting the interviews. Within 24 hours after the interview, the audio recordings were transcribed using the online transcription software Otter.ai. Transcripts were manually verified for accuracy, and corrections were made before exporting transcripts as Microsoft Word documents into the qualitative analysis software MAXQDA2020. The verification process provided us with an opportunity to be immersed in the data collected. When we reached data saturation, we stopped the data collection process.

The data collected were analyzed using thematic analysis because it is a process to identify, analyze, and report themes that emerge from the qualitative data [36]. We created contact summary forms [37] also known as memos [33] for each interview to be familiarized with the data; to capture immediately key concepts, themes, or issues that arose during the interview; and reflect on the data collection process. The data familiarization process occurred on a continuum from the data collection through data analysis. The contact forms or memos helped us to plan for the next interview, revise existing codes, and further the data analysis [37]. Thematic analysis involves the critical review of responses to determine appropriate coding and the formation of themes from those codes. We generated a preliminary codebook, which was modified as the coding process progressed. The codebook had a list of coding rules that included the code name, definition of the code, rules for when the code could be applied, rules for when the code could not be applied, and an example of coded data. The transcripts were coded using concept coding and simultaneous coding where applicable [38]. Concept coding is assigning a code to a large unit of data, while simultaneous coding is when data suggests multiple meanings and is assigned more than one code. The process of coding and organizing data was an iterative process of identifying themes, patterns, and categories across the data sets [37].

A theme-based overview grid/matrix was used to display and organize codes in a systematic way, which helped the researchers to be grounded in the data collected [39]. We used MAXQDA's Compare Cases & Groups function as a grid, which allowed comparison of coded qualitative data from the transcripts. We reviewed some codes and subsequently merged them into broader themes for a richer and more detailed story about canners' livelihood experiences. We used quantifiers to report the results like "a few", "some", and "most," to give the reader a sense of the overall experiences of the participants. This also helped us to be analytically honest and protected against biases [37]. The use of quantifiers in qualitative research is not to generalize results, but to provide detailed information on whether themes appear to be typical or atypical. Approval to conduct this research was obtained from Michigan State University's Institutional Review Board (IRB) prior to recruitment activities and data collection.

5. Results

This section presents the results of the interviews. It focuses on participants' demographic characteristics and the contextual factors that influence them to engage in collecting cans and bottles at football tailgates, and on livelihood capital assets, policies, and practices that enable or constrain canning livelihood activities at football tailgates and influence their outcomes.

5.1. The Socio-Economic Context of Canners

Individuals experience context-specific conditions that they may or may not have control over. Such conditions have a direct impact on the likelihood that vulnerable people can engage in canning activities to contribute to their living. Most canners have faced adverse socio-economic circumstances, which led to them being unemployed and, in a few cases, homeless. During the interviews, nearly all canners revealed that they collect bottles and cans at tailgates to supplement their current income. In addition, there was just one person who collects cans all year at different places, and it is his sole source of income. Three essential circumstances emerged during the interviews. Firstly, most elderly canners expressed that due to poor health, they can no longer formally work; hence this worsens their situation. These canners explained that they receive social security income and disability allowances as their primary sources of income, but it is not adequate to meet their basic needs. A male canner said, "I lost my job anyway, I got hurt in 1996 . . . then I'm on disability now for that. So, it is just hard for me. I gotta do what I gotta do to make a living, you know." Secondly, another canner shared that ever since the 2008-09 economic recession, she had not managed to recover from that economic shock. Lastly, one of the canners indicated that he lost his job and is now homeless; canning is now a temporary way of earning a living while he makes a long-term plan.

5.2. Livelihood Capital Assets

Respondents use natural, social, human, financial, and physical capital; in the interviews, they explained the challenges associated with accessing some capital types.

5.2.1. Social Capital

Social capital consists of the relationships that canners draw upon in pursuit of their activity. The qualitative analysis from the interviews indicated that knowledge sharing and social relations are essential forms of social capital to earn income from canning. They were discussed in the context of the canners' relationship amongst themselves, relationships with their next of kin, and with tailgaters.

Knowledge sharing: The majority of those interviewed expressed that canners tend to share knowledge about canning at tailgates through their friends, family members, and workmates. One canner said, "Actually, a good friend of mine told me about it, and I don't mind picking the cans now." This information includes schedules of football games, how to get access to cans at tailgates, and efficient and effective ways of collecting and redeeming them.

While canners may share information about canning activities with those canners who are their friends, a few canners expressed that there is limited trust among canners who do not know each other as they engage in collecting cans at football tailgates. Others expressed that canners are from different social circles of friends, which weakens their interaction with other canners outside their circles. In addition, most canners complained that some canners are known to steal unattended cans that other canners had already collected, weakening the level of trust among canners.

Social relations: From the interviews, canners have built social networks with other canners and tailgaters, and they also rely on family members for help. Canners with such relationships tend to collect bottles and cans more efficiently and effectively at football tailgates.

Most canners reported that during canning, there is minimal interaction with each other. This is because canners want to collect as many returnables as possible, and there is not much time for social interactions. A canner said, "I just say hi... I got to keep on moving. I really have got no time for conversation because am collecting cans. I ain't going to waste my time." In addition, some of the canners have a perception that they are in some competition to access the same resource.

A few canners indicated that they tend to work as a team with people they know well, for instance, their spouse or family members. All of the female canners interviewed indicated that they collect cans and bottles with a male companion who is either a partner or brother. In a few cases, the male partner goes around collecting cans while the female partner guards what they have already collected.

In addition, a few couples mentioned that canning is also an opportunity where they can spend time together. Lastly, a few mentioned that they rely on other members of the family for transportation resources to support their effort.

Moreover, most experienced canners have built mutual relationships with tailgaters, which have led to more efficient resource recovery of cans and bottles at tailgates. Such interactions have increased canners' easy access to returnables during tailgates. For instance, the canners revealed that some of the tailgaters save cans in bags for them to collect later during the football tailgate. "A lot of them (tailgaters) bag it up (cans) and tell you to come back and save them for you," one canner said. Another female canner said, "Because some people, like, they'll save the cans for certain people; that does happen. Not too often. But sometimes, I've seen them (tailgaters) do it." Another male canner who has been canning for the past fifteen years indicated that he hands out bags to tailgaters who save cans for him for later collection. However, a few canners mentioned that they avoid interacting with tailgaters at all, as this distracts from their activity.

Some of the canners think that tailgaters acknowledge their presence with limited interactions between them. The tailgaters toss their cans away from their tailgating party or close to the sidewalks, which minimizes their interactions with canners. Most of the canners indicated that tailgaters tend to dispose of their cans and bottles in accessible locations close to disposal bins or on open spaces, making it easier for any canner to collect.

5.2.2. Human Capital

Human capital includes the knowledge, skills, health status, and ability to engage in canning activities. While canning does not require any formal training, it does require a certain amount of experiential knowledge and good health.

Knowledge and skills: Canners who have been collecting cans over a long period tend to develop skills and techniques to collect cans at tailgates. The three types of knowledge and skills that emerged from the interviews included how to carry out the actual canning activity, how to approach tailgaters to have access to cans, and how to select returnable cans and avoid non-returnables. Such knowledge and skills sometimes are shared with new canners depending on one's social networks. For instance, many experienced canners have developed efficient and effective ways of collecting bottles and cans at tailgates. One male canner said, "My methods are now more organized definitely . . . . The first time ever, I was kind of like, everywhere, like, . . . instead of following down the line, I am now zigzagging . . . "

During the interviews, several canners mentioned that they have specific locations that they visit at every football tailgate, and the canners now know how to navigate those spaces as they collect cans easily. Some of the canners prefer tailgating spaces close to the football stadium where the number of cans disposed of is higher compared to other spaces. This also minimizes the distance they must walk to collect the maximum number of cans. On the other hand, the elderly canners expressed that due to poor health, they collect cans in spaces that they can easily access from local public transport, even though the density of cans available is lower. Nonetheless, most canners tend to specialize in collecting cans only and avoid bottles due to their weight.

Furthermore, most of the canners have developed skills to access cans and bottles from tailgating spaces without encroaching into personal spaces of tailgaters. During their first-time experience, most of the canners expressed self-consciousness of the stigma associated with canning. However, they have learned to develop specific skills to carry out their livelihood activity through time. The skills include maintaining eye contact, being respectful to ask for cans, and minimizing any forms of interaction with tailgaters. A first-time canner said, "It's like eye contact, body language, and I could read people pretty good. At first, I was nervous, but now, I think I got it. I got it (he is excited). I mean, look at my bag (showing me his full trash bag)!"

Lastly, the nearest grocery store does not accept every brand, and people learn that through experience as they develop skills in selecting only the bottles and cans they can redeem for money. For instance, one canner expressed disappointment the first time he collected cans at a tailgate and

realized that some cans were not returnable at the store he had gone to, and he had collected them for nothing. Such a lack of experience may increase a canner's vulnerability as they will not maximize their productivity as expected.

Good health: The main form of human capital that canners rely on is their physical strength and ability to collect and transport the cans and bottles during canning activities. Most participants emphasized that one needs to be physically healthy to participate in canning. In addition, some of the canners interviewed indicated that there are positive health outcomes associated with canning that strengthen their human capital. Some canners perceive canning as not only an opportunity to make money but also to engage in physical exercise.

On the other hand, some canners revealed that their poor health is a detrimental factor for them to participate fully in canning activities. A male canner, aged 58, said, "What slows me down is my health." They indicated that physical problems, such as high blood pressure, heart problems, asthma, and back and leg pain, limit their ability to walk long distances and the number of cans and bottles they can collect and carry at any given time. This, in turn, limits their earnings from canning at football tailgates.

5.2.3. Physical Capital

While canners rely on their human capital to collect cans, they also rely on physical capital in the form of equipment and supplies, transportation facilities, and bottle redemption centers. They have developed coping strategies to overcome challenges in accessing and using physical capital.

Transport: Many of the canners interviewed revealed that they either use public transportation or use their vehicles or bicycles to transport cans to the redemption centers. Many of the canners stated that the local public bus service is the most accessible means of transporting cans. However, public busses may not be accessible while carrying cans, as discussed below. Just a few canners interviewed have a personal vehicle, and they tend to collect as many returnables as they can, including both cans and bottles, unlike those who use public transport and bicycles. In addition, canners with personal transport can easily transport their cans to redemption centers that are not congested compared to others. One canner said, "I walked around and to a soccer field over there. There were so many cans lying out there... If I had a truck or car, I would have probably had been out all night... I can only carry so many." For those with their own vehicle, the main challenges are paying for parking or else parking far away to avoid paying.

Equipment and supplies: The equipment and supplies include trash bags, a household cart or shopping carts from the grocery stores, and gloves. During the interviews, most canners reported that they get the trash bags from their household, and a few revealed that they get them from the homeless shelter where they live. Lastly, most canners receive more trash bags from the university officials who patrol the campus during tailgates and hand out garbage bags to those who need them. However, most canners highlighted that the trash bags are difficult to transport as they tend to be bulky when they are full, making them difficult to carry or to take onto a public bus. These challenges limit what people can earn from canning. Most canners indicated that they double bag the trash bags to reduce the chances of tearing or buy industrial-strength bags.

Shopping carts or household pull-carts or wagons are common types of equipment that canners use to deal with the weight and bulkiness of bottles and cans. We observed some canners on bicycles with pull-carts attached. Such canners with a cart can transport as many cans and bottles as they can collect. Also, the use of the cart enables the canners to transport the cans and bottles without much physical strain. In contrast, a canner without a cart is sharply constrained. "I wish I had some kind of way to carry more. Basically, that's it. If I could carry more, I could collect more money," said one canner with no cart. As discussed below, canners revealed that they had been denied access to grocery carts from nearby stores over the past years, which threatens the effectiveness and efficiency of their canning activity.

During the interviews, a few of the canners revealed that they use gloves. These canners highlighted concerns for health and safety as they sometimes are in direct contact with liquids, and some dig in the trash cans. Another canner said, "I need these gloves because some of these people they put cigarette butts in the cans, I want to be clean at the same time." Moreover, some of the canners indicated that some tailgaters spit tobacco or stick gum in some of the cans, posing a health hazard to the canners. Some reported that sometimes they are offered food by tailgaters, but they cannot eat the food because their hands are dirty from canning. Given access to gloves, most of the canners would want to use them for canning activities.

5.2.4. Financial Capital

Financial capital refers to financial resources available for people to acquire resources and tools they need to earn a livelihood. In the interviews, canners emphasized the importance of having financial resources to help them begin to engage in canning activities. They need money to buy carts, trash bags, and gloves that they use to collect cans and bottles. Furthermore, they use their income to pay for their transportation costs to access recyclables at football tailgates and to transport them to the redemption centers. Most canners said they have other sources of income that enable them to pay for the necessities of canning. These include disability allowance, social security income, and income from seasonal jobs. On the other hand, some canners cannot afford to buy the tools they use for canning, limiting their capacity to can.

5.3. Policies and Practices

Policies and practices are mediating processes that create barriers or opportunities that allow canners to engage in their activity. There are decisions made by other stakeholders that have a negative influence on canners' livelihood activities. When interviewed, the canners expressed how some policies shape their canning livelihood activities and how they influenced access to and use of different forms of capital assets. The local grocery stores and local public transport service providers have policies that negatively affect canners' livelihoods. In addition, most canners are concerned about the possibility of policies that may limit their ability to collect cans.

Local grocery stores: The use of shopping carts from the local grocery stores and shops is now prohibited. Although there are still a few canners who take the risk of using grocery shopping carts, most of them have stopped. Some canners who previously used grocery carts are now finding it difficult to collect and transport their cans, which limits their earnings. In interviews, the canners indicated that what they would want to improve about their canning activities is having access to carts. However, some canners acknowledged that their use of grocery shopping carts inconveniences customers to the grocery stores; they understand the justification for the ban.

Public transport system: As highlighted earlier, many canners would like to use the local public transport system to transport their returnables to the redemption centers. However, most canners are denied use of the bus because the trash bags full of aluminum cans tend to be bulky and give a pungent smell of alcohol, which may bring discomfort to other passengers. A male canner said, "Sometimes I ride [the] bus if I don't have too many cans. But the driver always tells me that next time I won't give you a ride because you have all these cans which disturb people." This forces most canners to walk to the closest redemption centers, which is physically straining and time-consuming. However, one elderly female canner said she does not face challenges in using the bus as much as the younger canners, maybe because she is elderly.

Redemption centers: Most of the canners expressed two concerns about redemption centers: the limited number of returnables one can redeem at some redemption centers and congestion at the redemption center nearest the stadium. The closest redemption center has a $25 cash limit that it pays for any returnables on a given day, and they get a receipt for excess cans that they can redeem another time. Therefore, canners are forced to find another center where they can redeem the excess cans and bottles, or else wait and return another time, risking losing their receipt in the interim.

This becomes difficult as most of the canners do not have access to convenient transport. In addition, canners indicated that the closest redemption center is always congested. Most of the canners spend more time redeeming the cans than collecting them. One male canner said, "Like, the first time I did it, I think I waited in line for two hours before cashing the cans." However, some canners with vehicles can go to more distant grocery stores that are not crowded and that do not impose a limit on returnables. Some others take their cans and bottles home and prefer to redeem them days after the football tailgates.

Speculation about the university: Interestingly, most canners raised concern that the university might ban them from collecting cans at football tailgates. Through their social networks, there has been speculation that the university may want to earn income from collecting the cans and bottles at their football tailgates. One canner said, "I hope they don't stop us, you know because it's an opportunity for whoever wants to do it. You know, there's no discrimination. If you want to do it? You can do it too." During the interviews, some of the participants asked whether the university was planning to stop them. The interviewees considered it necessary that the university knows that this source of income is essential for their welfare, and they must continue to have access to canning.

5.4. External Shocks

The seasonality of football games and the seasonal changes in weather conditions at football tailgates affect canning opportunities, as does the level of attendance during tailgating. Football games are seasonal, from the end of August to the end of November. Some of the canners indicated that outside of the football season, they struggle to meet their needs, and they do not have much choice.

In addition, changing weather patterns during the football season create climatic shocks that influence attendance at tailgating events. Most of the participants explained that when the temperature drops towards the end of the football season, the number of tailgaters decreases, which reduces the number of cans and bottles they can collect. "But I noticed that some games, especially if it's poor weather, oh, there's not as many people out there collecting," revealed one canner. In addition to that, due to ill health, some canners are not able to fully engage in canning activities once it becomes cold, thereby resulting in reduced income. Another canner pointed out that when it is rainy and windy, it becomes harder for him to continue collecting returnables and push his cart. Most of the canners agreed that adverse weather conditions during football tailgates reduce their incomes and the number of returnables available. However, some canners highlighted that they will always collect cans irrespective of bad weather because they need the money.

Canners also indicated that the performance of the MSU football team affects attendance and thus the opportunity to earn from canning. When the team is doing well, crowds are more substantial, and income-earning potential grows. In 2019, the team did poorly towards the end of the season, so the crowds were smaller, and there were fewer cans to collect.

5.5. Outcomes

Although people collect aluminum cans and bottles to earn income, they cited other benefits as well. These include improved physical well-being and environmental stewardship according to the interview data. On the other hand, one canner clearly stated that she was canning to earn money for fundraising purposes and nothing else.

Income: In interviews, canners indicated that canning is an important income-generating activity for the unemployed or underemployed. Only one canner stated that he does not only can at football tailgates, he also cans in and around the city of Lansing. Most of the canners who receive disability allowance or are employed part-time revealed that meeting their basic needs is still a struggle. The income earned from canning, no matter how small, is important to meet their basic needs. The income is used to increase food security, pay for bills such as the internet and phone, and buy basic toiletries. One female canner said, "It's money to go to my income in my household. Basically, it is for food, and I pay bills. I paid my phone bill at one time."

Increased well-being: The data analysis revealed that increased physical well-being emerged as one of the relevant outcomes for some canners. Three participants who identify as males indicated that they do not only make money from canning, but it is an opportunity for them to work out. One of them said, "It's definitely your workout. But that's kind of why I'm doing it as well. It's a workout with carrying the bottles and picking them up." Another elderly canner felt that canning increases his physical well-being despite his poor health.

Most of the canners also expressed that the canning experience gives them an internal feeling of well-being. These canners expressed a good feeling from having been treated with respect while canning. Furthermore, they felt appreciated for their role in keeping the environment clean. One male canner said, "I actually got good comments from the tailgaters like you're doing a good job picking these cans, and this made me feel good … it feels warm inside here … (beats his chest). At times tailgaters will come and talk to you, which made me feel better".

Environmental stewardship: While canners acknowledge that they can earn a living, some of them also revealed that they even perceive this activity as a contribution to the environment in several ways. Most of the canners interviewed expressed that by recovering cans and bottles from the waste stream, they are helping maintain the environment; while at the same time, they are providing a service to the university by cleaning up during tailgates. One canner said, "I'm helping the environment because, like I said, if you look at it, just think of all these cans were just left on this campus … it will not look good. It will be nasty and dirty."

6. Discussion and Conclusions

This paper identified the different capital assets that people who collect aluminum cans and bottles at football tailgates have access to and use and the opportunities and constraints that they experience. Our findings of capital assets used by canners highlight similarities with studies in the everyday realities of informal recyclers in the global North. As with other studies [14] we found that supplementary income from canning supports canners' well-being. In addition to being a source of income, increased physical well-being, and an internal feeling of well-being are other outcomes of engaging in canning livelihood activities. The canners are treated with respect and dignity, and the tailgaters sometimes expressed appreciation for their role in keeping the environment clean. These positive outcomes keep the canners motivated to engage in their livelihood activities. Our findings are consistent with literature where canners, like any other worker, tend to establish a sense of self-worth and take pride in their work [40].

Our finding of a positive and welcoming environment for informal recyclers contradicts those of other studies where adverse outcomes like stigmatization constrain informal recycling activities [2,3]. However, it is notable that informal recycling is not widely visible in the Lansing area beyond tailgating. It may be that canning outside of tailgating would be stigmatized, thus limiting canners' opportunities and life choices [41]. This is an area for further study.

People who collect aluminum cans and bottles as a source of livelihood at football tailgates use a variety of capital assets. Having the knowledge and skills on how to carry out the actual canning activity, how to build rapport with tailgaters to have access to cans, and how to select the returnables with the deposit value enhance one's ability to engage in the livelihood activity. In addition, good health is key as it enables canners to collect more cans and bottles.

Having a cart or wagon or bike is an important asset for canners. Using a cart enables canners to collect all types of returnables and efficiently transport their cans during their livelihood activity. However, restricted access to grocery shopping carts limits canners' options. These findings are consistent with previous research in Canada [3,20], where the grocery shopping cart is the most used equipment by informal recyclers. In some instances, the use of grocery shopping carts is restricted [3]. Although, in these previous studies, using a grocery shopping cart as physical capital is associated with stigma as they are perceived as inappropriate, noisy, and uncomfortable. These challenges were not explored in this study.

Furthermore, the canners found it challenging to access and use redemption centers. The canners must walk if they cannot use public transport, which is physically straining as they will be carrying the cans. The long queues at the nearest redemption centers are time-consuming, which is a concern raised by most participants. Previous studies [14,15] emphasized that it is important for redemption centers to be easily accessible and useable to informal recyclers.

Moreover, the seasonality of football games, cold weather conditions towards the end of the football season, and poor attendance at football tailgates constrain canners' livelihood activities at football tailgates. These circumstances are beyond the canners' control; some of them stop canning, and others continue but with the expectation of lower revenues.

To conclude, we recommend that policymakers support the capital assets that enable informal recycling activities and reduce barriers that constrain successful engagement in this activity. Possible areas for further research include examining the sustainability of informal recycling activities in cities of the global North with a bottle bill deposit law and how these activities can be made compatible with formal recycling systems. Supporting informal recyclers helps to increase resource recovery and creates more inclusive and sustainable cities for all social groups. Future studies will have to explore the relationships between informal recyclers and formal waste management and recycling services. An understanding of these relationships may help to understand how informal recyclers co-exist with other stakeholders and the place-based context in which they operate.

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