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Impacts of urban safety net on income, food expenditure and intake capacity of poor households in Addis Ababa city, Ethiopia, 2021

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Although measures taken to address food insecurity and income inequality showed notable outcomes, they have continued to be major global issues mainly in urban areas of developing countries. To relieve these problems, Ethiopia started an urban safety net program in Addis Ababa city in 2017. The purpose of this study was to investigate the impacts and progress of the urban safety net program, mainly its cash transfers (CTs) on income, consumption, and food security of poor households using indicators based on elements of a theory of change and Engel's coefficient. It assessed whether the program was significant (or not) to program beneficiaries compared to situations before the start of the program, non-beneficiaries, and beneficiaries' sex. A total of 560 sample households were selected through a multi-stage sampling for household surveys. Comparative approaches, paired and independent *t*-tests, and linear regression were used to analyze the data. Results revealed that the CTs had a satisfactory targeting accuracy of the poor and produced positive effects on monthly income, savings, food expenditures and intake, and seed money for a business start. Since financial transfers account for a larger proportion of the income of households, current income becomes significantly bigger compared to income during the pre-program periods and non-beneficiary households. Food access, expenditure, and savings capacities of beneficiaries in post-CT became better than in pre-CT along with better food access and diet intake two to three a day than non-beneficiaries. Besides, coverage and benefits were statistically significant for women compared to men. The implementation of the urban safety net program is good in its positive impacts and progress toward nutrition and food security of poor households as a result of an increase in their income, food expenditure, intake, and access. This implies policymakers could potentially expect to see improvements in nutrition and food security, especially when targeting urban poor and female-headed households. However, delays in payments and work equipment, declining size and value of payments, and weak supplementary services are the program's shortcomings. Policy implications to improve the size of transfers, emergency aids, timely payments and equipment provisions, and interventions like regular business training, supervision, and guidance are recommended.

KEYWORDS

urban safety-net, impact analysis, performance indicators, food security, theory of change, urban planning

Introduction

These days, poverty rates around the world, and developing countries, in particular, are higher, mainly because urban poverty rates are quite high in large cities. In the face of continued poverty, limited income and household purchasing capacity have reshaped the current focus once again on food insecurity, mainly in middle and low-income countries. As a form of the productive safety net program (PSNP) and recently as an alternative to food aid, cash transfers (CTs) have been introduced as an instrument for food security in these countries. Existing literature showed the impact of CTs on hunger has been most pronounced in low-income countries where poverty is generally more severe (Blattman et al., 2013; Green et al., 2015).

In these settings, households receiving additional income are particularly likely to prioritize spending on improving the quantity and/or quality of food consumed. Cash transfers play a significant role to smooth food consumption and directly improve the quality and diversity of diet through increased and stabilized household income. Cash transfers may also improve the availability, access, and utilization of food for households (Attanasio et al., 2005; Arnold and Conway, 2011).

Like many countries in the developing world, the urban-rural poverty rate differential in Ethiopia is low in comparison to other countries. The total national poverty rate in 2011 was 29.6% (30.4% in rural Ethiopia and 25.7% in urban areas). The poverty gap index is estimated to be 8% in rural and 6.9% in urban Ethiopia (World Bank, 2015).

Food insecurity, income inequality, and poverty are the major underlying global themes in the Sustainable Development Goals (SDGs). Ending these problems has therefore continued to receive more attention in monitoring the progress of Sustainable Development Goal (SDG) targets (Haddad et al., 2015; Welteji et al., 2017). This holds for Ethiopia where poverty, food security, and low income, mainly among women, remain a central problem; about 27% of women of reproductive age are chronically malnourished (Blattman et al., 2014; Devereux et al., 2014; CSA ICF International, 2015).

Abbreviations: AABoFED, Addis Ababa City Bureau of Finance and Economic Development, Ethiopia; ASPIRE, Atlas of Social Protection: Indicators of Resilience and Equity; CTs, Cash Transfers; CCTs, Conditional Cash Transfers; CSA, Central Statistical Agency, Ethiopia; ETB, Ethiopian Birr; FAO, Food and Agriculture Organization; FGDs, Focus Group Discussions; GoE, Government of Ethiopia; HHs, Households; HLPE, High Level Panel of Experts on Food Security; ICF, Inter Container-Interfrigo International; IEG, Independent Evaluation Group; MoA, Ministry of Agriculture, Ethiopia; MoUDH, Ministry of Urban Development and Housing, Ethiopia; PPP, Per capita Purchasing Power; PWP, Public Works Program; UFSS, Urban Food Security Strategy; UJFSA, Urban Job Creation and Food Security Agency; USD, United States Dollar; WB, World Bank.

Addis Ababa's poverty rate is as high as 28.1%. From 2005 to 2011, consumption growth was negative for the poorest 15% of the urban population and the majority of Addis Ababa households, as wages did not rise to compensate households for rising food prices. In large cities like Addis Ababa, poverty has been falling, but not as fast as in rural areas and smaller urban centers. One-fifth of Ethiopia's urban population lives in Addis Ababa and reducing poverty rates in this city is a key priority (CSA ICF International, 2015; World Bank, 2015, 2018).

To alleviate this problem, the government of Ethiopia developed the Urban Food Security Strategy (UFSS) in 2015 through safety net programs. The objective of the strategy was to alleviate urban food insecurity and address the increasing levels of vulnerability, inequalities, and poverty. This was expected to be achieved over a long-term period through a gradual roll-out plan in different phases, starting with big cities that have a population of over 100,000 people (PSNP, 2014).

In Ethiopia, productive safety net programs started a long time ago and have achieved these goals mainly in rural parts of the country (Camilla et al., 2011). However, such programs are relatively new for urban areas and were implemented recently in 2017 (PSNP, 2014; Shigute et al., 2019). In this regard, Ethiopia's PSNP has a critical role in advancing food and nutrition security and livelihood targets of SDG 1, mainly for vulnerable communities such as women, the elderly, people with disabilities, and children (Burchi and Strupat, 2016; FAO, 2017).

The urban safety net program, which is the first of its kind in urban areas, is a 5-year phase-by-phase government program targeting 11 major cities in Ethiopia using a program Implementation Manual (PIM). This manual has benefited from the country's experience in delivering a rural productive safety net over the past 10 years. It is designed to facilitate the implementation and management of the program and to provide guidelines and operating procedures that will assist the key implementing institutions, mainly the Ministry of Urban Development and Housing (MoUDH), the Urban Job Creation and Food Security Agency (UJFSA), the Ministry of Labor and Social Affairs, and other relevant agencies including regional and city administrations and municipalities (Gilligan et al., 2008).

The urban safety net initiatives are being implemented in several developing countries, including Ethiopia, to benefit individuals and households who are food insecure, unable to work, or are experiencing a temporary decline in purchasing power by providing them with income. Such initiatives include cash transfer programs, subsidies, and labor-intensive public works projects. The urban safety net program was started to enable poor households or individuals to generate seed money (or initial capital) to begin new businesses and get involved in small and micro-enterprises, which are important steps toward the achievement of sustainable livelihood and food security (Ministry of Agriculture, 2014; World Bank, 2015; GoE, 2016).

In recent years, several studies (Attanasio et al., 2005; Arnold and Conway, 2011; Blattman et al., 2013; Burchi and Strupat,

2016; World Bank, 2018) have appeared focusing on safety net initiatives entirely from an African context. Almost all extant research on safety net in Ethiopia (Gilligan et al., 2008; Camilla et al., 2011; Devereux et al., 2014; Ministry of Agriculture, 2014; PSNP, 2014; Welteji et al., 2017; Shigute et al., 2019) exclusively focus on rural households without addressing similar impacts on urban households. In Ethiopia, unlike the safety net programs in rural areas, cash transfers (CTs) are the main intervention within urban PSNP, and it is a recent phenomenon which was rolled out by the government in collaboration with the World Bank in 2017 in Addis Ababa, where two-thirds of the country's poor households are found (GoE, 2016).

The most immediate impacts of CTs are expected to be an increase in income, food access, and consumption for poor or low-income households in urban areas. However, much is not known about the effects and roles of these CTs from the perspective of households in urban areas. There is also limited knowledge and evidence on the gendered dimensions of the CT programs, particularly on whether they contribute more to women's income, food purchasing capacity, and empowerment than men comparatively. The cash transfers started in urban areas and their impacts on monthly income, food security, and nutrition are unknown and they remain unexplored topics in previous studies.

Thus, a critical evaluation and examination is urgently needed to determine whether the urban safety net program implementation is practically productive and does it enhance the income, food expenditure, and intake capacity of program beneficiaries, particularly the poor and women-headed households. This research is motivated to explore the impacts of safety net which is a recent phenomenon in urban areas and identify further research and policy implications.

The debatable issues among scholars and literature on the helpfulness of safety net in urban areas relative to rural areas, the effectiveness of cash transfers in comparison to in-kind aid, and its effects on female-headed households compared to male-headed households inspired this study. This study, therefore, aims to explore the extent to which urban PSNP, particularly cash transfers, improve food security and nutrition at the household level in Addis Ababa, Ethiopia.

Given this research is almost the first of its kind focusing on urban or non-farmer households' in Ethiopia, it was also motivated to offer evidence-based responses to key questions regarding the performance, impacts, roles, and challenges of the PSNP particularly the CTs since 2017. It does this by examining the theoretical pathways advocating cash transfers as measures that can contribute to alleviating the level of household income, savings, food items purchasing, and intake capacity, as well as a diversity of diets. As a result, these were used as indicators to determine the level of household food security and nutrition improvements such as access, availability, and utilization of food.

To achieve the objectives, a modeling framework, composed of four steps, was undertaken. Initially, a preliminary analysis was done to determine the implementation and performance level of the CT program using parameters such as targeting accuracy, adequacy, generosity, and benefit incidence of CTs. Second, the research applied the theory of change and Engel's law as a theoretical foundation to identify relevant indicators, measures, and hypotheses regarding the impacts of CTs. Accordingly, the following four hypotheses were developed to guide the content of this study.

- Cash transfers have improved monthly income, food purchasing and intake capacity, and the variety and number of daily diets of poor households.
- Through CTs, the increased incomes have contributed to the improvement of food consumption and security of poor urban households.
- The observed benefits are more substantial to program beneficiary households compared to situations in periods before the start of the program and relative to non-beneficiary households.
- The benefits related to monthly income, food purchasing, intake capacity, and variety of diets are also more significant in female beneficiary households than their counterparts.

Third, the study adopted a conceptual framework that outlines the impacts and pathways of cash transfer on household income and basic components of food security. Lastly, "with and without" and pre/post impact evaluation designs, paired samples and independent samples *t*-tests, and Mann-Whitney linear and binary logistic regression models were applied to estimate, model, and evaluate the impact of the CTs. These were also used to verify the extent to which the theoretical claims or assumptions of the change theory and Engel's law contribute in practice in the context of low-income urban households.

Thus, this paper contributes to the existing literature and body of knowledge on the impacts of CTs on household food security. This study can fill the knowledge and literature gap by offering an urban perspective and by analyzing the debatable issues on the effectiveness of cash transfers in comparison to in-kind aid and its effects on women relative to men beneficiaries. It provides a more in-depth analysis by using homogeneous and consistently measured variables to explore the differential effects of CTs on a range of outcomes on food security and nutrition. Thus, it can inform the recent developments, trends, new challenges, and opportunities for policymakers and planners in designing innovative pathways to enhance the safety net program and address income inequalities and food insecurity in urban areas. Concerning methodological contribution, the author employed theory-based, latest, multi-criteria, and statistical analysis to estimate a continuous relationship between the CTs, household income, food purchasing capacity, and food security.

In general, the objective of this study is to examine the implication and impacts of urban PSNP, particularly cash transfers, on food security and nutrition of program beneficiary households. More specifically, it explored the extent to which monthly incomes, saving practices, food purchasing capacity, and daily food or nutrition intakes are enhanced and how the challenges are impeding the program implementation and goals.

Review of the literature

Role of cash transfers in household food security: Theory and evidence

A review of related literature was carried out for theoretical and empirical evidence based on the leading research question: "Are urban PSNP mainly cash transfer programs capable of contributing to the income, food consumption, and food security of poor households?" The Public Works Program (PWP) is a commonly used social protection or safety net instrument to provide support, mainly cash transfers, to working-aged people who are poor, unemployed, or underemployed and working in jobs that have low productivity (Anna, 2013). Cash transfers are an increasingly popular social protection mechanism used by many developing countries to improve food security and the nutritional status of lower socio-economic groups. The overall objective of the program can, therefore, be seen as preventing the intergenerational transmission of poverty. The major type of CT programs that has been used mostly in developing countries is conditional CT (CCT). The number and size of CTs have increased noticeably in the last 20 years (Honorati et al., 2015).

To receive assistance, a conditional cash transfer program requires beneficiaries to undertake a specific activity, such as public works or training. After the condition is fulfilled, CTs are given to poor and vulnerable people with no restrictions on how the cash is to be spent and no requirements beyond meeting the eligibility criteria, for example, being poor. Conditional cash transfers focus on human capital development and usually target households with children of primary or secondary school age (Pega et al., 2015).

Thus, CCTs are widely designed to achieve the objective of reduction of short-term food insecurity by improving low-income households' immediate consumption levels and nutritional status (FAO, 2008; HLPE, 2012). Household food security is the condition when all people at all times have access to sufficient, safe, and nutritious food. It is also defined by the availability of household resources to purchase adequate food for all family members, particularly by cash income. Spending on food, the amount and diversity of diets, food frequency, consumption behaviors, and experience of food insecurity are the most common measures of household food security (Smith and Haddad, 2002).

Engle's coefficient and theory of change is commonly used to explain the internal logic of an intervention (i.e., CTs for increased income, food purchasing capacity, and food security) and to hypothesize cause and effect links. As indicated in the conceptual framework, key assumptions of these theories are used to explain the sequence of changes, such as "impact pathways" or "outcomes chain". Engel's Law indicates that lower-income households spend a greater proportion of their income on food than households with a middle or higher income. As food costs increase, the percentage spent by lower-income households is also likely to increase. Focusing on a single activity, i.e., a cash transfer program, this study explored statements of change such as: "If we take 'x' action, then 'y' change will result, because..." These statements were discussed within the context of the program, and subsequently, evidence was sought to support them (Ober, 2012).

Both theories helped to identify evaluation questions or key hypotheses, undertake context analysis, explore assumptions and how the intervention worked (i.e., CTs), test the hypotheses, and assess evidence for the hypotheses. The PSNP's CT component has the potential to result in various benefits. By increasing household income, cash transfers can theoretically contribute to food security and consumption. This is because increased household income can increase food availability and access to food for the poorest households directly by enabling households to purchase food and by increasing household actual and share of expenditure on food. Increased household income can also increase food utilization and nutrition directly by improving the number, quality, and diversity of daily meals, resulting in improved nutritional status (Smith and Haddad, 2002; Arnold and Conway, 2011). Cash transfers that are implemented as part of a broader package of interventions linking beneficiaries to supplementary services such as knowledge, information, safety, and nutritional supplements have also addressed other causes of malnutrition and intra-household inequalities, mainly through women's empowerment (Yoong et al., 2012; Hagen-Zanker et al., 2017).

Recent studies (Haushofer and Shapiro, 2013; IEG, 2014; Bastagli et al., 2019) show that CTs may also directly affect intra-household dynamics. If the transfer is distributed to the female heads of households, they are better able to advocate for their preferences as a result of controlling more resources. As the majority of households' income is spent on food in many developing countries, food security improved as a result of receiving CTs. Households receiving CTs had better dietary diversity than those receiving food, suggesting that CTs may be more effective. This is because cash transfers give dignity, choice, and flexibility to affected populations and therefore play a key role in achieving nutrition security for all (Gilligan et al., 2008).

According to Attanasio et al. (2005), the increased income allowed households to overcome credit and saving constraints, and households became willing to take on more profitable investments if the regular income was reliable. It also indicated

that, through increasing household income, the positive impact of CTs on hunger and food security has been most evident in low-income countries, where poverty is commonly harsher. Similarly, food consumption and food security of over seven million rural people who were previously dependent on relief have been improved by the Productive Safety Nets Program in Ethiopia (Gilligan et al., 2008; Baye et al., 2014).

However, the impact and contribution of such kinds of PSNP to household food consumption and food security in urban areas of Ethiopia and Africa have not been adequately studied. Thus, the gap in research, literature, and recent knowledge on this particular topic has motivated the author to conduct this study.

Conceptual framework

There are numerous approaches used to hypothesize and model the linkages between CTs and their impacts on food consumption and security. However, for this study, the appropriate approach is to use CTs as a starting point or input and conceptualize the different impacts at the individual and household levels, with one of the potential impacts being food and nutritional status. This approach is more useful for the contextualization and better identification of how CTs can affect the core causes or pillars of food security and therefore the pathways of impact. This conceptual framework's approach is also relevant to key assumptions of the theory of change (ToC) and Engle's coefficient.

When looking at the evidence on how cash transfer programs affect income, food security, and nutritional outcomes and impacts, it is important to distinguish between the outputs, outcomes, and impacts of CT programs. The author explored the reasons behind the findings shown in this paper after making impact evaluations and discussing the extent to which the evidence supports the theoretical assumptions on the role of CTs in contributing to household food security by looking at the output, outcomes, and impacts in the conceptual framework shown in Figure 1.

The key criteria and pillars of food security include households' economic and physical access to food; food utilization, which is the proper uptake of nutrients in the body through consumption; availability of food determined by business and food production; and stability of the other three dimensions over time (Smith and Haddad, 2002; FAO, 2008).

The conceptual framework in Figure 1 shows that CTs potentially have an impact on all pillars of household food security. Through increased income and purchasing capacity, households may invest in their businesses and increase household-level food access and utilization. Households with increased economic access to food are capable of purchasing more food and more diversified products. Finally, a consistent household income may improve and stabilize food consumption and security over time (Maxwell et al., 2013).

In this conceptual framework, the pathway through which CTs may contribute to the basic output, outcome, and impact is by making additional financial resources available for food security. Accordingly, CTs directly increase household income and, consequently, the resources available for household food security. When households use their cash and income to buy more or better food or to invest in a business or productive assets, they improve both their food security and their diet diversity (Gertler et al., 2006; Adato and Bassett, 2009).

Materials and methods

Description of the study area

Addis Ababa is the capital city of Ethiopia, Africa. Its population is estimated to be close to five million. Though it is the capital of the country and the seat of major commercial operations, 30% of its population is under the poverty line, which is slightly higher than the national average. About 26.1% of the residents face food poverty and women, more than men, are affected by poverty. Overall, 48.7% of Addis Ababa residents are poor or vulnerable to poverty and income inequality; the Gini coefficient of real consumption per capita for the year 2015 was estimated to be 0.32, which is quite low compared to many other cities. As indicated on the map of the study areas in Figure 2, there are ten sub-cities in the Addis Ababa city administration. Under each sub-city administration, there are "woredas" or districts which are the lowest units of administration. For example, Bole and Yeka sub-cities are arranged into 14 and 13 woredas (or districts) under their jurisdiction, respectively. According to the data obtained from food security offices, there are about 2045 and 2019 food-insecure and safety net program first-round beneficiary households in Yeka and Bole, respectively (AABoFED, 2015; Ethiopian Mapping Agency, 2019).

Site selection and sampling technique

Using a multi-stage sampling technique, both probability and non-probability sampling were employed to select households for the collection of cross-sectional data through household and community surveys. In the first stage, Addis Ababa was purposefully chosen among 11 other recipient cities targeted by the program because it accounts for about one-third of the poor and food-insecure households and PSNP program beneficiaries in the country. At full capacity, the program aims to benefit close to 604,000 people in two rounds, with about 200,000 people (almost one-third) from Addis Ababa (AABoFED, 2015).

In the second stage, due to the homogenous nature of the CT program beneficiary households in all ten sub-cities of the city,

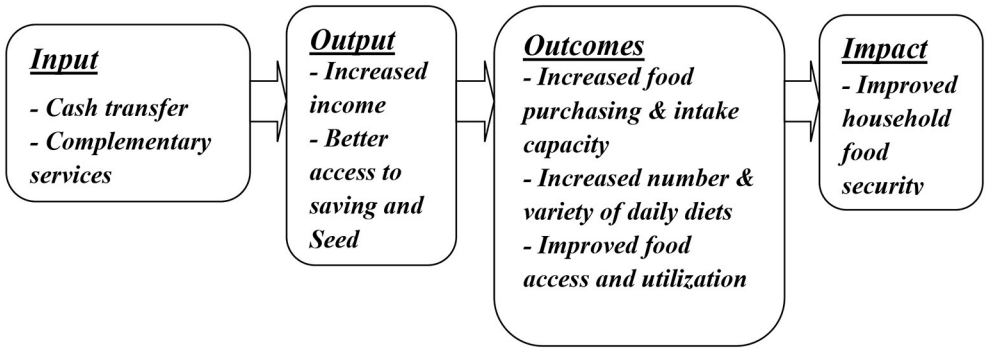

FIGURE 1
Conceptual framework; causal pathways of CTs to improve household food security. Author's adaptation from Rebecca et al. (2013).

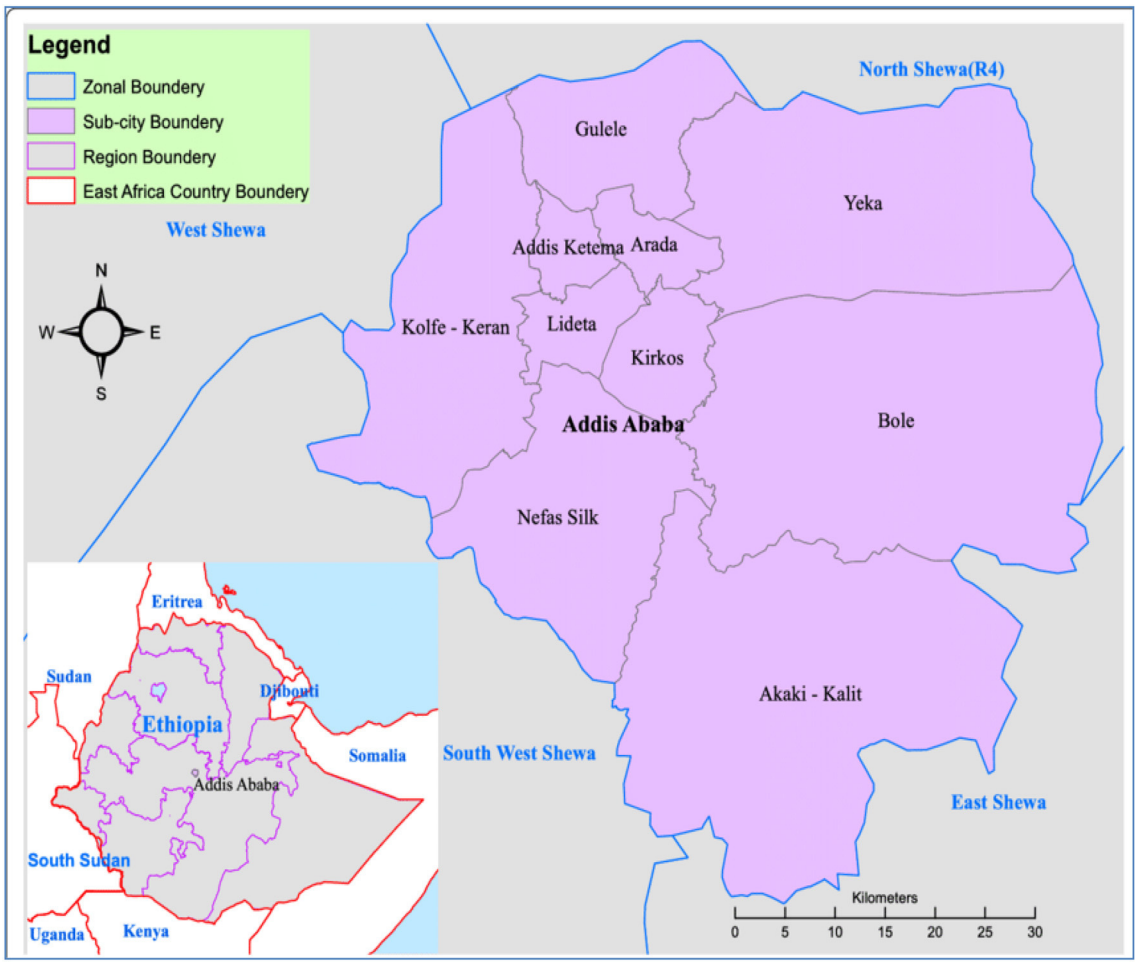

FIGURE 2
Map showing Addis Ababa with administrative sub-cities designations. Bole and Yeka sub-cities were selected randomly as sites for analysis (Ethiopian Mapping Agency, 2019).

and the limitation posed by research funding, two sub-cities, i.e., Bole and Yeka, were identified using the simple random technique. In the third stage, a sample of food-insecure program beneficiary and non-beneficiary woredas (districts) were selected in proportion to the overall number of chronically food-insecure woredas within the selected two sub-cities using simple random

sampling. A total of 27 woredas (Bole-14 and Yeka-13) were reviewed to ensure a geographical dispersion of the sample and to cover a variety of representative conditions such as inner and outer-city neighborhoods in each sub-city. Finally, 8 out of 27 woredas (about 30%) were randomly chosen as representative samples of the study sites.

These eight woredas were chosen with probability proportional to size (PPS) based on the estimated chronically food insecure population (that is, the beneficiaries) of the Bole and Yeka sub-cities. From Yeka, four beneficiary woredas (namely, woreda 7, 10, 12, and 13), and from Bole, another four beneficiary woredas (namely woreda 4, 9, 10, and 15) were proportionally drawn as the study sites.

From both sub-cities, a sample size of 324 beneficiary households (HHs) was estimated using about 4,064 study population, a 95% confidence level, and the formula of Anthony (2014). So, a total adjusted sample size of 280 beneficiary households from both sub-cities or about 35 from each woreda was estimated for households with CTs group or treatment group.

From each woreda, other households (equivalently food insecure, poor but not included in the program, or households without CTs) were used for comparison with program beneficiaries through a quasi-experiment. To this end, the author selected a comparable number of eligible households living in the same woreda and equivalently food insecure and poor but currently non-beneficiary households. About 35 such households, equivalently food insecure met the selection criteria of PSNP but currently not participating in the program due to various reasons, were chosen from each woreda (or 280 from both sub-cities).

According to the discussion with local authorities, experts, households, and beneficiary selection committee, the major reasons for a restricted coverage of PSNP in the capital city were limited quota of beneficiaries needed by the program from each woreda, selection bias by the committee, lack of formal residence ID card, and non-appearance of eligible households during election time. However, they assured that for both types of households the income, food insecurity, poverty and asset levels, indicators of social networks, and exposure to economic shocks in the 2 years before the start of PSNP were similar. It was hard to gather information and test the selected outcome variables regarding both types of households such as income from before the start of PSNP due to the absence of similar surveys and past data. Therefore, having non-beneficiary households from the same communities as CT beneficiaries helped to ease the risks of PSNP impact estimation bias by providing a similar distribution of those unobserved community characteristics.

Respondent households from each woreda of both sub-cities were equally classified into two groups representing current PSNP beneficiary households with CTs (treatment group) and non-beneficiary households without CTs (control group) for quasi-experiment, and comparative and differential impact evaluation using "with and without CTs" scenario.

Households who were currently participating in the program were considered beneficiaries and included in the treatment group if they received any CTs since 2017 for undertaking work on PSNP-supported public works every month, or they had received access to at least one intervention or service provided under the CTs. Whereas households that had or had not been previous PSNP beneficiaries, who meet the selection criteria such as residence location, poverty, and food insecurity level but were not currently participating in the program were included in the comparison or control group. Other things and variables being constant, these two groups of households were made different based on the receipt (or not) of CTs to make reasonable comparisons and estimates of impacts.

Finally, specific enumeration areas (EAs) where the PSNP was active were identified within woredas using PPS sampling and in collaboration with local authorities and experts. For the household and field surveys, 280 CT beneficiary households and 280 non-beneficiary households were selected for the sample using simple random sampling with replacement using separate lists of PSNP beneficiary and non-beneficiary households. This yielded a total sample of 560 households for the quantitative household survey and quasi-experiment of this study. Samples of the PSNP survey were designed to comprise a fitting comparison group. The samples were drawn exclusively from woredas or sites where PSNP was actively operating in and about one-third of the sample was composed of non-beneficiary households living in similar neighborhoods and communities as program beneficiaries. An additional 20 key resource persons from households, experts, and managers were also purposively chosen and participated in the interviews and discussions. Thus, the sampling design, research sites, and households were assumed to be representative and provided reliable estimates, conclusions, and generalizations about the program's impacts on income and food security goals.

Mixed research and impact evaluation approaches

A mixed research approach was an ideal technique to conduct this research and provide empirical and more conclusive evidence using various approaches than a single research approach would. Considering the research questions which required both quantitative and qualitative evidence, a sequential strategy of a mixed approach was specifically suitable to obtain different but complementary data on the topic and best understand the impacts on income and food security.

The integration of quantitative and qualitative data in the form of a mixed-methods study has great potential to strengthen

the rigor and enrich the analysis and findings of the CT program's impact evaluation. As studies of food security with different approaches come to different conclusions about 'who is poor' and different causation conceptions reach different conclusions about the causal impact of development programs such as CTs, a mixed research approach is used for this study. A mixed approach is an appropriate method to explore reliable knowledge and "hard" evidence based on the knowledge claim of the pragmatism research paradigm.

This mixed methods approach integrates participatory qualitative approaches and co-produces quantitative data collection tools, which provide generalizable data geared toward supporting the refinement programs to strengthen food security. These co-produced and mixed approaches could offer unique insight, complementing and enhancing existing knowledge or evidence about multidimensional issues. It could also help the researcher to complement existing data by enhancing contextualized and locally specific information about the unique urban CTs program impacts.

As both qualitative and quantitative approaches highly rely on a facilitation process, the mixed methodology is helpful to conduct a series of processes within the stages of household food security such as contextualization, community perception, household survey, verification, replication, and engagement. In line with the research questions, a mixed approach was used to integrate different data collection processes including literature review, expert consultation, semi-structured interviews, and household surveys.

Moreover, this study was done based on key elements of Engel's law and theory of change (ToC) that could be used as evidence and a basis for economic impact evaluation. Since a single source of evidence could not be used for comparative evaluation, the evidence was drawn from different methodologies. Much of the evidence came from econometric studies, case studies, and models, particularly Ex-post, Diff-in-diff, and Pre/post impact evaluation using multiple impact indicators and were used to make impact analysis.

Accordingly, this study used comprehensive impact evaluation methodologies and models that could bring new and adequate evidence to economic intervention choices such as safety net programs. The impact evaluation approach brought new evidence to urban safety net program implementation choices. It could test basic assumptions about the effects of the urban PSNP, particularly CTs, on household food security through access and availability of food. It could also test new ways of doing safety net program interventions better and shed light on the role of complementary interventions. The evidence could represent the percentage change and impact across time and targeted beneficiary households based on impact indicators such as monthly income, savings, seed money, household food purchasing, and daily food intake capacity.

Pre-post and difference-in-difference comparative assessment

A pre-post analysis approach was used based on before-after comparisons that assume that all changes over time are due to the safety net intervention measures mainly CTs, and no other factor. This temporal comparison and impact evaluation methodology were predominantly based on before and after-safety net analyses.

According to few studies (Klatt and Taylor-Powell, 2005; Heath et al., 2020), this type of pre/post analysis model, specifically a retrospective pretest evaluation design, is better for such situations that include measuring change over a very short period of time, capturing factual or routine information, attempting to gauge perceptions of change as a result of program participation, trying to diminish response-shift bias, or trying to evaluate change without having collected baseline data before the start of the program (Howard, 1980; Sudman et al., 1996).

The impacts of cash transfers of the public works sub-program were compared with a scenario that would have existed had this project not been undertaken. To this end, a "before-after" evaluation design and temporal comparison techniques were applied using pre- and post-CTs scenarios (i.e., before and after 2017). Since the urban safety net program through CTs started in 2017 in Ethiopia, this year was used as a reference point for program impact evaluation and temporal comparison. In addition to the basic elements of the theory of change and Engel's law, changes and impacts on household food consumption and security were measured using multi-criteria evaluation including the adequacy of CTs, monthly income, saving, food purchasing, intake capacities, and access to food. To account for changes and differences in beneficiary households when comparing pre and post-program income and food expenditures, the income and food security outcome variables were expressed on a per capita basis for each household. In this pre/post design, data are time variant because they are about the income and food security status of beneficiary households before and after receipt of CTs. To this end, data were collected in mid-2020 using a questionnaire survey for both the pre- and post-PSNP outcome variables.

Difference-in-difference (Diff-in-Diff or DID) and "with-without" evaluation designs or techniques were used for the analysis of impacts and differential impacts among comparable groups based on with and without the beneficiary status of poor households. For this purpose, two groups were designed as balance tests between poor households who were recipients and non-recipients of CTs. These analysis techniques could help to determine which group of poor households benefited more from food consumption and security through CTs.

Accordingly, a quasi-experiment, particularly propensity score matching (PSM) was used. The researcher used these statistical techniques to construct an artificial control group by

matching each treated unit (i.e., treatment group of program beneficiaries) with a non-treated unit (i.e., comparative group of non-beneficiaries) of similar characteristics and variables except the receipt of CTs. Using these matches, the researcher could estimate the impact of CTs. It was conducted between program beneficiary households with CTs and non-beneficiary poor households without CTs (as a control group). This statistical technique was employed by studying the differential effect of CTs as a treatment or intervention on a 'treatment group' vs. a "control group" to highlight the differential impacts of CT on income and food security.

As indicated in the sampling technique section, 280 households receiving CTs were identified for the treatment group and another 280 households who were not receiving CTs were identified for the control group. Although the control group differs in the absence of treatment (i.e., CTs) both groups were strongly believed to be comparable, identical, or equivalently poor households, and other variables were controlled or kept constant. As this difference in the absence of treatment in the control group was considered for the post-CT period or since 2017, it could be differenced out by deducting group-specific means of the outcome of interest, relative to the treatment group that was receiving CTs. The remaining difference between these group-specific differences must then reflect the causal effect of interest such as effects on or changes in monthly income and food purchasing power.

Description of the dataset

The primary data used in this paper were collected using district-level household surveys and semi-structured interviews as part of a larger mixed-method of explanatory research type to examine the impacts of CTs of the safety net program on income and household food security.

A cross-sectional research design was applied to collect primary data regarding the income, saving practice, food purchasing capacity, number and variety of daily diets, level of access to food, and availability of food in both pre- and post-CTs periods i.e., before and after the introduction of the program in 2017.

After data cleaning and preparation, out of 560 samples, the final and valid sample size was 541 households (beneficiary-271 and non-beneficiary-270), which resulted in a 96.6% of response rate. A review of relevant literature and documents was also carried out to find pertinent secondary data.

Data analysis methods

The impacts of CTs on food security were analyzed using both quantitative and qualitative analysis methods. As indicated in the conceptual framework section, the parameters and measures of food security that apply to developing counties are the level of monthly income, monthly food purchasing capacity, food access, and utilization, as well as food intake capacity, which is measured in terms of the number and variety of daily diets consumed before and after CTs. The impacts of other external variables such as inflation were considered and controlled.

Independent-samples *t*-test was employed to compare the mean monthly income difference between CT beneficiary households and non-beneficiary households as well as women headed households vs. men headed households. To analyze mean monthly income differences between before and after CTs on the same program beneficiary households paired samples *T*-test was used. Besides, linear regression was employed to assess the existence of a significant relationship and predict the effect of CTs on the monthly income of beneficiaries. Accordingly, this model could estimate the percentage amount of variance or change in the monthly income of beneficiaries that is explained or predicted by monthly CTs. Binary logistic regression was also run to predict the progress of female and male-headed households either to food security (or insecurity) status as a result of financial transfers and income enhancement, keeping other external factors constant.

Independent samples Mann-Whitney U and Kruskal-Wallis test were used to compare and test the existence of significant median differences in the satisfaction and agreement level of women vs. men for enhanced monthly food expenditure capacity as a result of CTs. Both were also used to test the significance of the statistical difference between CT beneficiary households and non-beneficiary households on the current average number of daily food intake in their family.

To compare and test the existence of significant median differences in the saving practice of CT beneficiary households before and after participating in PSNP, the related samples McNemar Test was employed. These statistical tests help to measure the overall impacts and progress of CTs of PSNP on household food consumption and security.

Besides, interviews and discussions were transcribed, and thematic analysis was performed including coding of qualitative data before identifying and reviewing key themes. Each theme was analyzed to find an understanding of participants' opinions and insights regarding the contributions of the CT program to the income and food security of urban poor households.

Results

The findings of this study are subject to two caveats. As data were collected more than 1 year after the program began in 2017, this study should be considered an interim assessment of the program's impact. Due to a lack of well-organized past data or surveys in the pre-CT period, the data regarding the characteristics of beneficiary households or situations before the start of the CT program was based on the memory of

respondents collected through recall but not directly tested. To properly consider and address the shortcomings, the study made a special effort to ensure the inclusion of poor beneficiary and non-beneficiary households (HHs) from different sub-cities of the city with and without evaluation design.

Since the pre/post model through a retrospective pre-test evaluation design provides more information than a post-test-only design, this model was selected for its advantages of multiple data points. As indicated by various research (Howard, 1980; Sudman et al., 1996; Klatt and Taylor-Powell, 2005; Heath et al., 2020), to overcome the measurement error through response-shift bias or recall data, a meaningful pre/post-CT program comparison was done by helping participants to use the same frame of reference to measure themselves against (i.e., 2 years before and after 2017 in this study).

Besides, the author attempted to capture factual information or routine behaviors (e.g., income and food recall) and changes over a very short period of time (2 years only) that are more accurately reported in pre-tests because people remember fewer details as time passes.

The significance of effects of CTs on monthly income

Monthly income of beneficiary households before and after-CTs

After the adequacy and targeting accuracy of CTs were assessed through preliminary analysis, the real impacts, contribution, and progress of the monthly CTs on household income and food security were analyzed using various variables, indicators, and scenarios.

In Table 1, a paired samples *t*-test indicates that the mean difference between the monthly income of beneficiary households before and after cash transfer has statistical significance. The null hypothesis (H_o) stating that the monthly income of program beneficiaries before and after CTs are equal, was not accepted ($p < 0.001$). On average, participants showed a mean monthly income before CTs that was lower than the mean monthly income after CTs by about 983.33 ETB (or about 22 USD, ($p < 0.001$), two-tailed).

Here, it is imperative to bear in mind that monthly income throughout this survey refers to the overall income of households including the cash transfer provided by the Public Works Program and other additional income from various direct or indirect sources.

Regarding the total monthly income of households participating in PSNP vs. non-participating households in Table 2, both Levene's test and independent samples *t*-test indicate that the null hypothesis which states that the average monthly incomes of both households participating and not participating in PSNP is equal was rejected at ($p < 0.001$).

The mean difference between the average monthly income of participating and non-participating households in PSNP was statistically significant. On average, participants showed that the mean monthly income of households participating in PSNP or program beneficiaries was higher than the mean monthly income of non-beneficiaries or non-participating households by about 1,089.5 ETB (or about 24 USD, ($p < 0.001$), two-tailed).

How do CTs affect and predict income of HHs participating in PSNP

As indicated in Table 3, linear regression was calculated to predict the monthly income of program beneficiaries based on monthly cash transfers in ETB ($p < 0.001$). The null hypothesis which stated that the coefficient is equal to zero i.e., the monthly CTs has no relationship and no effect on the monthly income of beneficiaries was rejected.

Thus, a significant regression equation was found ($p < 0.001$). From the Pearson correlation model, it was found that monthly CTs was positively and strongly correlated with monthly income ($p < 0.001$). Besides, a model summary shows that 55.8% of the variance or change in monthly income is explained and predicted by CTs.

The regression model evidence also shows that when monthly CTs provided to an individual program beneficiary increased by 1 ETB (or about 0.0224 USD), the monthly income also increased by 1.57 ETB (or about 0.0351 USD).

According to the interviews with key resource persons on the effects and contribution of this safety net program, one major reason for its recognition was that the safety net program, mainly the public works sub-program, directly addressed shortages of income and vulnerability. Subsequently, the effects and benefits of this program were evaluated to be immediate, positive, and indirect, by addressing income inequalities and making economic growth more inclusive among the poor.

Monthly food cost of beneficiaries before and after taking part in PSNP

A paired samples *t*-test in Table 4 indicated that the mean difference between the monthly food cost or expenditure of beneficiaries before and after participating in PSNP had statistical significance. The null hypothesis was not accepted ($p < 0.001$). On average, participants showed that the mean monthly food cost before-PSNP benefit was lower than the monthly food cost after-PSNP benefit by about 194.17 ETB (or about 5 USD, ($p < 0.001$), two-tailed).

Saving practice of beneficiary households before and after PSNP

In Table 5, related samples McNemar test shows that the null hypothesis (H_o) suggesting the practice of saving by beneficiaries

TABLE 1 Monthly income of beneficiaries before vs. after-CTs (in ETB).

Paired samples *t*-test

	Paired differences				t	df	Sig.
	Mean	Std. error mean	95% Confidence interval of the difference				
			Lower	Upper			
Average monthly income before PSNP cash transfer - Average monthly income after PSNP cash transfer	−983.33	26.68	−1,035.85	−930.80	−36.85	269	0.000

Computed using survey data (2021). N:B 1ETB is equivalent to about 0.0224USD, June 2021.

TABLE 2 Monthly income of households participating in PSNP vs. non-participating households.

Independent samples *t*-test

		Levene's test for equality of variances		*T*-test for equality of means				
		F	Sig.	t	Sig.	Mean difference	95% Confidence interval of the difference	
							Lower	Upper
The monthly average income of respondents in ETB	Equal variances assumed	102.2	0.000	30.7	0.000	1,089.5	1,019	1,159
	Equal variances not assumed			30.8	0.000	1,089.5	1,020	1,158

Computed using survey data (2021). N:B 1ETB is equivalent to about 0.0224USD, June 2021.

is equally present both before and after the start of PSNP, is rejected ($p < 0.001$). Besides, in the cross-tabulation analysis shown in Supplementary material, it was found that about 213 replied "YES" and only one respondent and "NO" to the question "Do you practice saving from monthly income after the start of PSNP?". Similarly, about 213 replied "NO" and only one respondent replied "YES" to the question "Do you practice saving from monthly income before the start of PSNP?". Thus, the monthly saving practice of beneficiaries was not present in the period before participating in PSNP, whereas it was present in the post-PSNP period.

Level of food purchasing power of households participating in PSNP vs. non-participating households

In Figure 3, Mann-Whitney U and Kruskal-Wallis tests show that there was a statistically significant difference in food purchasing power, at Pearson chi-square ($p < 0.001$). The food purchasing power of households participating in PSNP was greater than households who were not participating in PSNP.

The food purchasing power of 35.7, 29.4, 16.4, 6.7, 5.2, 4.5, and 2.2% of 269 households participating in PSNP were High, Very High, Extremely High, Neutral, Low, Very Low, and Extremely Low, respectively. Conversely, the food purchasing power of 35.8, 27.4, 26.3, 6.6, 1.5, 1.5, and 1.1% of 274 non-participating households were Very Low, Low, Extremely Low, Neutral, Very High, Extremely High, and High, respectively.

Significance of PSNP to female beneficiaries compared to their counterparts

To promote the differential impact analysis on the impact and contribution of PSNP cash transfers from a gender perspective, the program's significance, particularly to female-headed households was compared to male-headed households. This survey reviewed the gendered-impacts of the programs and how outcomes differed according to the gender of program beneficiaries.

TABLE 3 How does financial transfer affect and predict income of households: Linear regression model.

Correlations

Correlation	Variables	Income (in ETB)	Cash transfer (in ETB)
Pearson correlation	Income (in ETB)	1.000	0.747
	Cash transfer (in ETB)	0.747	1.000
Sig.	Income (in ETB)	.	0.000
	Cash transfer (in ETB)	0.000	.
N	Income (in ETB)	269	269
	Cash transfer (in ETB)	269	269

ANOVA[a]

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	37053921.810	1	37053921.810	336.687	0.000[b]
	Residual	29384535.430	267	110054.440		
	Total	66438457.250	268			

Model summary[b]

Model	R	R square	Adjusted R square	Sig. F change
1	0.747[a]	0.558	0.556	0.000

Coefficients[a]

Model		Unstandardized coefficients		t	Sig.	95% Confidence interval for B	
		B	Std. error			Lower bound	Upper bound
1	(Constant)	519.52	66.68	7.79	0.000	388.22	650.82
	Cash transfer (in ETB)	1.57	0.08	18.34	0.000	1.41	1.74

[a]Dependent Variable: Monthly average income of respondents (in ETB). [b]Predictors: (Constant), Cash transfer received per month (in ETB). N:B 1ETB is equivalent to about 0.0224USD, June 2021. Computed using survey data (2021).

TABLE 4 Monthly food cost of beneficiaries before and after participating in PSNP.

Dependent samples *t*-test

	Paired differences				t	df	Sig.
	Mean	Std. error mean	95% confidence interval of the difference				
			Lower	Upper			
Average food cost before participating in PSNP-Average food cost after participating in PSNP (in ETB)	−194.1	6.29	−206.56	−181.78	30.86	265	0.000

Computed using survey data (2021).

TABLE 5 The level of saving practice of beneficiaries before and after participating in PSNP.

Related samples mcnemar test

Null hypothesis	Test	Sig.	Decision
The distribution of different values across Do you practice saving from monthly income before participating in PSNP? and Do you practice saving from monthly income after participating in PSNP? are equally likely.	Related Samples McNemar Test	0.000	Reject the null hypothesis

Asymptotic significances are displayed. The significance level is 0.05. Computed using survey data (2021).

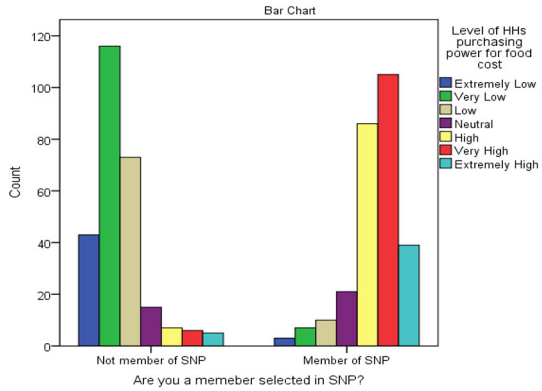

FIGURE 3
Level of the purchasing power of households participating in PSNP vs. non-participating households for food cost. Computed using survey data (2021).

Proportion of cash transfer going to female beneficiaries compared to male

In Table 6, the independent samples *t*-test indicates that the null hypothesis suggesting average monthly cash transfers going to both female and male households participating in PSNP is equal was not rejected ($p < 0.056$). The mean difference between monthly cash transfers going to female and male households participating in PSNP was not statistically significant. On average, participants showed that the mean monthly cash transfer received by female and male program beneficiaries was 767.75 (or 17 USD) and 712.72 ETB (or 15.9 USD) respectively.

The mean monthly cash transfer difference between female and male program beneficiaries was only 55 ETB (or 1.2 USD, ($p < 0.056$), two-tailed). As one of the key dimensions of gender-based analysis was assessing whether cash transfers were targeted to female or male, and whether there was a significant difference between both recipients. This study found that female program beneficiaries were receiving an equally good amount of cash transfer or benefit as male beneficiaries per month.

Monthly income of female beneficiaries compared to male beneficiaries

In Table 7, the independent samples *t*-test indicates that the null hypothesis stating that the average monthly income of both female and male households participating in PSNP is equal was rejected ($p < 0.035$). The mean difference between the monthly income of female and male households participating in PSNP was statistically significant. On average, participants showed that the mean monthly income of female and male beneficiaries was 1,760.48 (or 39.4 USD) and 1,635.26 ETB (or 36.6 USD) respectively. The mean monthly income difference between female and male beneficiary households was 125 ETB (or 2.8 USD, ($p < 0.035$), two-tailed). Thus, it was found that in the post-PSNP period monthly income of women CT beneficiary households was higher than the income of their men counterparts by about 125 ETB. Here, monthly income refers to the overall income of households from various direct and indirect sources including the cash transfer.

Agreement level of female beneficiaries compared to male about PSNP outcomes on the food expenditure capacity

As indicated in Figure 4, independent samples of the Mann-Whitney *U* test and the Kruskal-Wallis test were also run to check the significance of the difference in the level of agreement between female and male beneficiaries toward positive outcomes of PSNP on their food purchasing capacity. Thus, the null hypothesis which indicates that the level of agreement on positive outcomes of PSNP is the same across categories of sex was rejected, ($p < 0.001$). Regarding the outcomes of PSNP on food purchasing capacity, the level of agreement of female and male beneficiaries had a statistically significant difference.

Figure 4 also shows that the majority or 59.1 and 29.6% of 115 female beneficiaries agreed and mostly agreed, respectively, on the positive benefits of PSNP toward food purchasing capacity. On the other hand, out of 151 male beneficiaries, 60.9 and 30.5% agreed and mostly agreed respectively. Similarly, binary logistic regressions also showed that female beneficiary HHs have more possibility to achieve food security status than

TABLE 6 The proportion of CTs received by female vs. male program beneficiaries.

		Levene's test for equality of variances		*T*-test for equality of means				
		F	Sig.	t	Sig.	Mean difference	Lower	Upper
How much cash transfer is received per month (in ETB)?	Equal variances assumed	0.026	0.872	1.92	0.056	55.03	−1.38	111.4
	Equal variances not assumed			1.92	0.055	55.03	−1.18	111.2

Computed using survey data (2021).

TABLE 7 Monthly income of female beneficiaries vs. male beneficiaries: Independent samples *t*-test.

		Levene's test for equality of variances		*T*-test for equality of means				
		F	Sig.	t	Sig.	Mean difference	Lower	Upper
Monthly income of respondents in ETB	Equal variances assumed	7.68	0.006	2.08	0.038	125.22	6.93	243.52
	Equal variances not assumed			2.12	0.035	125.22	9.08	241.36

Computed using survey data (2021).

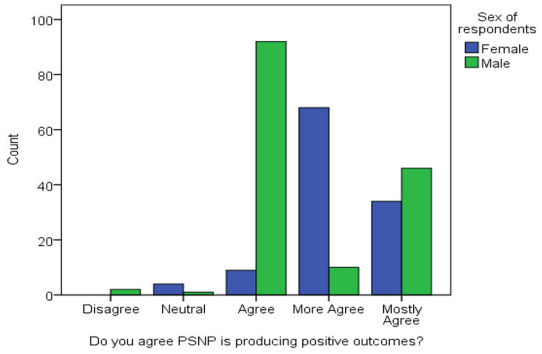

FIGURE 4
Agreement level of female beneficiaries compared to male toward positive outcomes produced by PSNP on food purchasing capacity. Computed using survey data (2021).

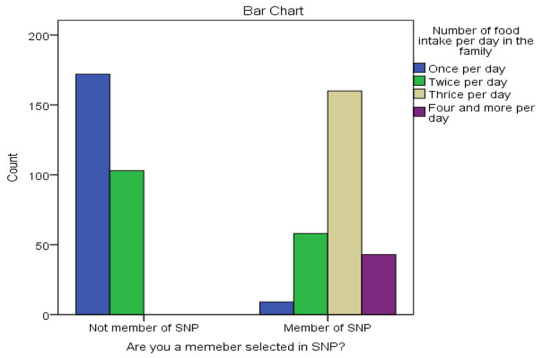

FIGURE 5
The existing number/frequency of daily food intake between program beneficiary households and non-beneficiary households. Computed using survey data (2021).

male HHs as a result of the financial transfers and enhancements of income. That meant the possibility of going to the status of food insecurity was more for male beneficiary households than female ones.

Number of daily food intake of beneficiary vs. non-beneficiary households

Independent samples Mann Whitney U and Kruskal-Wallis tests were run to test the statistically significant difference between program beneficiary households and non-beneficiary households in the number of daily food intake in families. Figure 5 shows that there was a significant difference between program beneficiary and non-beneficiary households in the average number or frequency of daily food intake in the family (Pearson Chi-Square, $p < 0.001$).

Figure 5 demonstrates that among the households which are not beneficiaries of PSNP, 62.5 and 37.5% currently take food one and two times per day on average, respectively. Whereas among the households who are beneficiaries of PSNP, 3.3, 21.5, 59.3, and 15.9% currently take food one, two, three, and more times per day on average, respectively.

The existing numbers or frequency of daily food intake at the family level in households who are not beneficiaries of this safety net program are by far lower than those households who are beneficiaries of the safety net program.

Shortcomings and challenges of PSNP implementation

This section seeks to address the key research question "What factors affect the implementation, contribution, and impacts of safety net program on sustainable income and

livelihood of the poor?" Based on the survey, interviews of key resource persons, and evidence, the following findings regarding limitations and challenging factors that negatively affect the implementation of PSNP and its effects were found.

- The majority of beneficiaries receive cash/financial transfer and inputs for public works activities such as uniform clothes, shoes, work equipment, gloves, and safety materials, but not always on time,
- For the majority of households, their cash transfer was characterized by a reducing trend in the past two to three years in comparison to the current cost of living, local market, and periods of shock such as the novel coronavirus (COVID-19) pandemic,
- The inclusion of some non-eligible beneficiaries as well as the distribution of benefits that are not adequately targeted at the poorest quintile groups of program beneficiaries,
- Lack of supply-side supplementary services and support by concerned bodies, and
- Lack of awareness and cooperation from the community residing around public work areas.

Discussions

The results of the impacts and progress of the urban safety net CT program on income, food expenditure, and intake capacity of the urban poor are discussed as follows.

The significance of effects of the CT program

Monthly income of beneficiaries in the post-CT period relative to both pre-CT periods and non-beneficiaries

Few studies (Bourguignon et al., 2004; Arnold and Conway, 2011) indicate that by improving the income of households in the short term and human capabilities in the long term, and cash assistance given by public work sub-program to poor households may increase the affordability of food, health care, or education. Recent research has also found that CTs significantly increases expenditures for both male and female recipients, in comparison to non-recipients (Blattman et al., 2013; Green et al., 2015).

To measure the real effects and progress of the program through this survey, one of the basic outcome variables - monthly household income of program beneficiaries in the post-CT period - was compared with their income before the start of the program and against the income of non-beneficiary households. This study found that the monthly income of beneficiary households in the post-CT period had increased by about 983.33 ETB (or 22 USD) compared to monthly income in the pre-CT period mainly because of the financial support provided by the public works sub-program. This meant that the financial assistance provided by the program could make a change of about a 140% increase in the monthly income of beneficiary households.

Besides, evidence showed that there was a significantly different impact across program beneficiary and non-beneficiary households on household income. Overall current monthly income was substantially higher for program beneficiaries receiving a cash transfer compared to the monthly income of poor households not benefitting from the program. This meant the existing monthly income of poor households who are not participating in the program was far lower because they were not selected by the program to receive a financial benefit. By considering an equivalent poverty level between both groups of households, it was found that the monthly income difference of 1,089.5 ETB (or 24 USD), i.e., over 100 percent, is because of the financial benefits going to poor households participating in the program.

This evidence generally reveals that the largest share in the increase of total income of program beneficiary households in the last couple of years is linked and attributed to financial benefits provided by the public works sub-program. This financial assistance going to poor households is making a significant change in the improvement of their monthly income. Thus, it is easy to understand that as planned this public work sub-program is showing positive impacts and progress on the income of the poor by significantly increasing the size of monthly income. The enhancement of household income, in turn, has its implication and contribution to better seed money, household food expenditure, consumption, and access.

How do CTs affect and predict income of beneficiary households

Gilligan and Sarah (Gilligan, 2013; Sarah, 2013) confirmed that financial benefits provided to poor households and individuals have wide-ranging outcomes such as better income, savings, and expenditure. Additionally, recent studies (Arnold and Conway, 2011; Honorati et al., 2015) indicate that financial assistance going to poor households from the public work sub-program may increase the affordability and intake of food, health, or education by enhancing their monthly income in the short term and human capabilities in the long term. As an outcome of CTs, consistent household income may improve and stabilize food consumption over time (Maxwell et al., 2013; Rebecca et al., 2013).

Correspondingly, based on evidence obtained from the linear regression analysis of this study it can be suggested that monthly cash transfer is a good predictor variable for monthly income. This is because the regression coefficient shows that for every additional ETB in financial transfer, income is expected to increase by 1.57 ETB (or 0.0351 USD) on average. If the monthly financial transfer is zero, monthly income is expected

to remain at 519.52 ETB (or 11.6 USD) on average. Accordingly, in the post-PSNP financial transfer period, more than 50% of the increase in the monthly income of program beneficiaries is due to financial transfer.

This evidence demonstrates that a significant share in the increase of income of beneficiary households in the last 2 to 3 years can be attributed to financial benefits provided by the public works sub-program. Thus, it is possible to infer that the implementation of PSNP is showing significant progress and effect on the advancement of income and food in poor households.

Monthly food cost of beneficiaries before and after taking part in PSNP

In addition to Engel's law and change theory, few other studies (Gilligan et al., 2008; Bastagli et al., 2019) reveal that there is a comparatively large evidence base connecting financial or cash transfers to an increase in household total expenditure including expenses on food, housing, and poverty reductions. An increase in total household expenditure is associated with all kinds of financial benefits such as an increase in per capita monthly total expenditure and a 15% increase in total monthly consumption expenditure for urban households (Haddad et al., 2015; Pega et al., 2015; Mohammadi, 2016).

It is shown that the range of increase from a 5.3 percentage point change in total percapita expenditure to a 33 percentage point change in total expenditure respectively (Braido et al., 2012; Perova and Vakis, 2012; Baye et al., 2014).

CTs increases not only household income and food purchasing capacity but also households' access, availability, and utilization of food which are the basic requirements for improved household food security (Anna, 2013).

Household food expenditure capacity was considered as an outcome variable and performance indicator to evaluate the real impact and changes brought about by the cash transfer program. Accordingly, the current food expenditure capacity status of beneficiary households (in the post-financial transfer period) was compared to their status before 2017 (pre-financial transfer scenario).

Similarly, evidence about the impact of cash transfers on food expenditure shows that the mean monthly food expenditure capacity of beneficiary households had comparatively increased in the post-financial benefit period. It increased from 273.87 ETB or about 6.1 USD (mean monthly food cost pre-PSNP benefit scenario) to 468.05 ETB or about 11 USD (post-PSNP benefit scenario); the increase was about 194.17 ETB (approximately 5 USD). This meant the monthly food expenditure capacity of households showed a 59% (on average) increase mainly because of the financial benefit provided by the program.

Considering the generally increasing nature of food costs in Addis Ababa from time to time, the largest share in an increase of food expenditure capacity in the last couple of years post-2017 can be attributed to benefits provided by the program.

Therefore, it is possible to conclude that the urban safety net through its financial assistance has provided positive outcomes as planned. Financial assistance to poor households has made a significant change and improvement in their food expenditure capacity. It has produced significant contributions to the enhancement of food expenditure of poor households by increasing their monthly income. This positive outcome in turn implies the improvement of household food expenditures, intake, access, and food security status.

Saving practice of beneficiaries before and after taking part in PSNP

Concerning the impacts of cash or financial transfers on saving practice, the findings of several studies mostly showed statistically significant positive effects. For example, recent studies (HLPE, 2012; Haushofer and Shapiro, 2013) found that doubled cash savings balances and a 10% increase in the share of households saving has an effect of getting financial benefit from Kenya's Give Directly program. In Mexico, financial benefits or cash transfers resulted in a significant increase in the likelihood of having savings as well as access to a bank account and credit for beneficiary households, but no effects on the amounts of savings (Gertler et al., 2006; Angelucci et al., 2012).

Financial transfers provided by the SAGE program in Uganda resulted in a statistically significant increase in the proportion of beneficiary households that have savings (Merttens et al., 2015).

In this study, the current status of saving practices of beneficiaries (in the post-cash transfer period) was analyzed and compared to previous years' status (pre-cash transfer scenario).

Similar to other studies, this study's findings show that there is a statistically significant difference between the saving practice of beneficiary households before and after participation in the public works sub-program. Before participating and receiving financial benefits from the safety net program, the observed households had no saving practices. Whereas, in the post-PSNP period, these households developed monthly saving practices as a result of the enhancement of their monthly income through financial benefits. Evidence shows that cash transfers to poor households is making a significant positive difference in their habit or practice of saving. Getting an adequate income source can help poor households lift saving constraints and accumulate capital to start a business.

Accordingly, it is possible to understand that this safety net program is showing good progress and a range of positive effects such as increased households' saving habits and engagement with savings groups as compared to a situation in pre-financial transfer periods. Households could either use the financial benefit to increase their access to savings and credit or pay off existing debt. Such saving practices can allow poor households

to satisfy future household demands, accumulate seed money, and open businesses as well as act in response to emergencies such as food insecurity, accidents, and sickness.

Level of food expenditure capacity of households participating in PSNP vs. non-participating households in PSNP

Although financial supports were underutilized, they have wide-ranging outcomes mainly on the economic and social conditions of poor households and individuals such as better household expenditure or consumption capacities when measured and compared to food aid (Adato and Bassett, 2009; Mohammadi et al., 2011). Recent research has showed that financial assistance improves socio-economic outcomes and makes food more affordable by enhancing household income in the short term and human capabilities in the medium and long term (Bourguignon et al., 2004; Arnold and Conway, 2011).

In this study, the level of monthly food expenditure power was analyzed and compared between program-beneficiary households and non-beneficiary households. The findings of this study prove that even if the poverty level of both categories of households is equivalent, their current food expenditure capacity level is significantly different. Evidence also shows that as a result of financial benefits provided by PSNP the level of food expenditure capacity of households participating in PSNP is generally higher compared to households not participating in PSNP.

The lower level of food purchasing power of the poor households who are not participating in PSNP is because they are not receiving financial transfers or benefits from the program. Among the various sources of purchasing power, financial transfer provided by PSNP accounts for the largest share or percentage for the majority of households participating in the program. Whereas, for poor households not participating in the program the dominant sources of purchasing power are beggary and help from kith and kin.

Thus, it is possible to infer that by enhancing the monthly income of poor households, the public works sub-program is playing significant and positive roles through its financial transfer. Consequently, these financial benefits provided by safety net programs could make a difference and help poor households in enhancing their food expenditure capacity as well as better food access and security.

Significance of PSNP on female beneficiaries compared to male

To promote and supplement the evaluation of the effect and progress on income and livelihood of program beneficiaries, its significance particularly to females was analyzed in comparison to males. Thus, this survey reviewed the effects of safety net programs on gender-related results and how outcomes differed according to the gender of the program beneficiaries.

Proportion of CTs going to female beneficiaries compared to male counterparts

Research focusing on eligibility and targeting performance of safety net programs surveys (Smith and Haddad, 2002; Haushofer and Shapiro, 2013; Bastagli et al., 2019) showed that both sexes benefited in different ways and there were significant differences in the impact between the main recipients. Female-headed households received financial assistance and benefited as much as their male counterparts (Pega et al., 2015; Hagen-Zanker et al., 2017).

Eligibility criteria and beneficiary targeting mechanisms may have an important mediating effect on the effects of financial/cash transfers made by safety net programs (Yoong et al., 2012; Handa et al., 2014). Due to this reason, the actual benefits and progress of the public works sub-program toward female-headed households were further evaluated by the household survey considering an outcome variable -mainly the proportion of cash transfers going to the main recipients. Hence, the proportion of household headship and monthly cash transfer was compared between female and male beneficiary households. Since the majority of households participating in the program were female-headed, female-headed households were well-targeted by and participated in the program.

Moreover, evidence shows that the aggregate amount of financial transfers going to females was slightly higher compared to male households. Since the difference is only 55ETB and not statistically significant, it is easy to recognize that female beneficiaries received financial assistance as much as male beneficiaries. The public works sub-program is providing females with a good amount of financial assistance as males per month for the last 2 to 3 years. This has implications and contributes to reducing income inequalities between poor males and females. In general, based on evidence, it is possible to conclude that the eligibility criteria and targeting mechanisms of the public works program are gender-sensitive and inclusive as planned.

Monthly income of female beneficiaries compared to male beneficiaries

Concerning the impact of the financial transfer on the monthly income of beneficiaries of both sexes, some studies (Blattman et al., 2013, 2014; Green et al., 2015) have revealed a statistically insignificant positive effect of financial transfer for females i.e., no increase in expenditure and income for female beneficiaries compared to males. On the contrary, it was found that both sexes benefited from safety net programs in different ways and significant differences remain between the main recipients (Yoong et al., 2012; Bastagli et al., 2019).

In this study, the current monthly income of female beneficiary households were compared against male beneficiary households. Accordingly, a statistically significant difference in the monthly income of female and male beneficiary households was seen. Regardless of equivalent cash transfers received by both categories of beneficiaries in post-PSNP, the overall monthly income of female beneficiaries was found to be higher by about 125 ETB compared to their male counterparts. Even though this amount of income difference may not be substantively larger enough considering the current local market value, such differences are created when financial transfers are either spent or invested.

As per the opinion of most of the key resource persons, while financial transfers are often spent on monthly expenses by male beneficiaries, financial transfers are not only spent but also saved up and invested by female beneficiaries for additional income-generating businesses. If not the only, financial transfers for these female households are the dominant source of income which also indirectly helps them as means of seed money to take part in other supplementary income-generating activities. However, male beneficiaries are found to be relatively weaker in taking part in supplementary income-generating activities.

Since female households are relatively more vulnerable groups in the urban community, it is fair and acceptable to benefit them as well as enhance their income through such types of financial transfers. Although another detailed assessment is required to show more statistically significant differences in outcomes for both sexes, the available evidence of this study indicates that female households are not just participating in the program well but are also getting as many benefits compared to males. As planned, the public works sub-program is significantly contributing to the enhancement of income, business, food access, consumption, and security of poor women households in the city.

Agreement level of female beneficiaries compared to male about outcomes of PSNP on the food expenditure capacity

According to Yoong et al. (2012), AIR (2014), IEG (2014) when females receive financial benefits or cash transfers, consumption decisions were often found to be more focused on children and investing in different types of assets compared to males. Providing financial benefits to females makes a difference and significantly enhances female's empowerment and decision-making power independently and jointly with their husbands in urban areas.

Evidence shared in few studies (Perova and Vakis, 2012; Rebecca et al., 2013; Hagen-Zanker et al., 2017) confirm that cash transfers have positive outcomes on women's opportunities such as monthly income, household purchasing power, and reduction of child labor for program beneficiaries of both sexes. Notably, it could help to reduce the time spent on domestic work by women compared to men.

In this study impact of the CT program on female-heade households were also evaluated using the opinion of beneficiaries about their satisfaction or agreement level on actual benefits and contribution of the program to food purchasing capacity. Hence, the current level of satisfaction or agreement was compared between both sexes. Evidence shows that the overall level of agreement of female beneficiaries on the benefits of PSNP to food purchasing capacity and food security status is slightly higher than males. Although the majority of female and male beneficiaries tend to agree on the benefits of financial transfers to food purchasing capacity, male beneficiaries' level of agreement or satisfaction and food security status is relatively lower.

This means the recipient of cash transfers, whether male or female, has an impact on outcomes such as the purchasing capacity, access, and utilization of food. Cash transfers have differing impacts on female beneficiaries compared to males both directly and indirectly. Besides, the existing number or frequency of daily food intake by families of non-beneficiary households is twice and once on average. On average, most beneficiary households take food three, two, and four times per day. Because of membership in the program and financial transfers received, the existing numbers of daily food intake at the family level in beneficiary households are far greater than in non-beneficiary households.

From this, it is possible to understand that PSNP is showing good progress and significantly contributes toward the improvement of food purchasing capacity and the daily food intake of poor communities. The involvement and benefit of poor female households are given relatively better attention by PSNP. As planned, poor female-headed households are not only better covered and participated in PSNP, but they are also better benefited and satisfied by the financial benefits for the enhancement of their overall income and food security status.

Shortcomings and challenges of PSNP implementation

The implementation of the safety net and the graduation of beneficiaries are widely affected by challenges (Daidone et al., 2015; Heath et al., 2020). Although PSNP CTs of public works sub-program is significantly contributing and progressing toward the enhancement of income and food consumption, and security of households, factors are affecting the implementation and contribution of the program. Hence, the program's shortcomings and challenging factors that negatively influence the implementation and observed benefits include: first, the timing of financial transfers and provision of inputs for public works activities such as uniform clothes, work equipment,

and safety materials are often delayed and postponed for an unknown time.

Second, the monthly financial transfers being provided since 2017 are reducing in their amount and lower in value as compared to the current market and cost of living. Such unintended effects and problems resulted from the rigid nature of the benefits system and are often magnified by the influences of unexpected periods of disasters such as increasing inflation and recently the state of emergency due to the novel coronavirus (COVID-19) pandemic. Third, although this program is generally pro-poor, there is the inclusion of some non-eligible beneficiaries as well as the distribution of benefits that are not adequately targeted at the poorest quintile groups of program beneficiaries.

Lastly, a lack of supply-side supplementary services and support such as training, information, supervision, and follow-ups may hinder the complete achievement of PSNP objectives and contributions. Improper waste disposal practices of local communities on public work sites, and lack of adequate awareness and cooperation from the residents' side are also constraints.

Conclusions

This study provides a household survey, impact analysis results, and evidence of how financial or cash transfers provided by urban PSNP in Addis Ababa have contributed in terms of impacts, roles, and progress toward enhancement of income and food security of poor households. In line with key assumptions of the theory of change and Engel's law regarding the changes expected from the intervention program, overall evidence reveal how powerful and influential financial transfers provided by safety net programs are. Evidence also reveal the wide-ranging changes and effects on program beneficiary households.

This study reports statistically significant results and the vast majority of cash transfers are in the progress toward the direction that policymakers intend to achieve. Because of the consistency of findings across the critical outcome areas and multiple indicators employed by this study, findings are found to be particularly significant.

Since the targets of this cash transfers program under implementation are poor and nearly poor households it is found to be pro-poor and good in targeting accuracy. Besides, the survey conducted by this study has indicated clear and significant impacts of the CTs program, especially for intended outcomes such as monthly income, savings, expenditure capacity on food, frequency of daily food intake, and access to seed money for a business.

There is stronger evidence showing that financial transfers or CTs account for a larger share of the monthly income of the vast majority of beneficiary households. Findings suggest that the financial transfers sub-program can play a key role in improving livelihoods across the region. Interestingly, the information gathered for this study strongly suggests that the post-financial transfer phase had favorable effects and modifications on savings, seed money, household food expenditure, and intake capacity.

When compared to pre-PSNP conditions and impoverished non-beneficiary households, it is observed that these outcome factors are greater for program-beneficiary households in the post-PSNP period.

Thus, cash transfers have resulted in significant incremental change and benefits including the enhancement of households' income, and access to and consumption of food. This study examines whether impacts vary amongst families based on the sex of the primary beneficiary. A bigger percentage of cash transfers going to female households provides compelling evidence of the importance of cash transfers for beneficiary households headed by women. Available evidence strongly confirm that CTs lead to income improvement and involvement in the supplementary business for women headed households. Cash transfers are not only spent but also saved up and invested by women beneficiaries for additional income, compared to men counterparts. Though both men and women beneficiaries tend to have better satisfaction and agreement on subsequent outcomes of CTs for food purchasing and intake capacity, women's levels of agreement are relatively superior.

As a result of financial transfers, the current number, and frequency of daily food intake by beneficiary households are also found to be greater than in non-beneficiary households. Hence, as expected the PSNP has been successful in improving income and related access to utilization, and use of food for poorer communities, especially women. Access to the CTs of the PSNP increased the likelihood that households carry out their own business or income-generating activities, but slightly reduced the likelihood that males entered the business or income-generating activities. Policymakers can realize that targeting the poor and female-headed households could potentially lead to greater proportionate income enhancement and improvements in productive livelihoods and food security. The study highlights the importance of the public works or CTs sub-program as one of the key components of the overall productive safety net program.

However, it investigates unintended effects and shortcomings of CTs that result from challenging factors that affect program implementation and helpful outcomes. This includes delayed CTs, the size and value of financial transfers reducing from year to year, mainly relative to the rising inflation, cost of living, and disasters like the COVID-19 pandemic.

To address program constraints, potential solutions are suggested such as policy reforms to scale up the CT program and expand its coverage. A timely payment, regular increase in the size of the monthly financial transfer, and additional emergency aid mainly to more vulnerable beneficiary households such as pregnant and mothers with more children are necessary.

This is especially true in periods of disasters such as the COVID-19 pandemic. Future research can be done at a relatively wider scope to compare the impacts of CTs on food security at both urban and rural people at a country or regional level.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

The author confirms being the sole contributor of this work and has approved it for publication.

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Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fsufs.2022.1031213/full#supplementary-material

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