The Effects of Integrated Conditional Cash Transfers and Public Works Programs on Household Income Generation in Rural Tanzania

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Abstract

Conditional cash transfers (CCTs) and public works (PWs) programs are implemented to improve the welfare of extremely poor households in rural Tanzania. However, there is limited information on how integrated programs impact household income generation. Using the propensity score matching method, data from both treatment and control groups were analyzed, focusing on major income-generating activities in rural areas such as crop farming, livestock keeping, non-farm businesses, and casual labour. The findings reveal that the programs have not significantly impacted income-generating activities among poor households, indicating persistent difficulties in escaping the poverty cycle. Despite this, the programs have stimulated non-farm businesses, which are typically categorized as petty businesses with low returns. Encouraging outcomes were observed in some households that utilized their cash to purchase farm inputs and livestock. This implies that that policymakers and program founders should consider adding productive conditions such as promoting crop farming, livestock keeping, and group savings.

1. Introduction

Conditional cash transfers (CCTs) and public works (PWs) are welfare programs implemented through cash transfers to extremely poor households in the community (Satumba, Bayat and Mohamed, 2017; Tadesse and Gebremedhin Zeleke, 2022). The major role of these programs is directed to alleviate poverty, improve food security, education, health, and nutritional status (Fiszbein, Schady and Ferreira, 2009; Wong, 2012; Nguyen and Rieger, 2017; Mussa, Agegnehu and Nashakira-Rukundo, 2022). Welfare programs

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through cash transfers initially were introduced in Latin America in the early 1990s, and spread all over the world. Many governments in less developing countries (LDCs) have been implementing these programs, helping extremely poor households improve their living standards and reduce poverty, while attaining the 2030 sustainable development goals (SDGs). CCTs provide cash on monthly or bi-monthly basis depending on the program, while PWs provide a lumpsum of cash in a given period interval (NBS, 2016; TASAF, 2017). Also, PWs provide a temporary job to one person in a household, in fifteen (15) days of paid work per month carried out in an interval of four-months per year during the lean season (Daidone *et al.*, 2019; World Bank, 2020).

CCTs and PWs programs work on specific poor and vulnerable families, intending to support specific actions, usually investments in human capital such as keeping children in school or taking them to health centres on a regular basis (Fiszbein and Schady, 2009). CCTs have two elements: the first element is fixed basic transfers, aimed at improving household consumption on an ongoing basis; and the second is variable conditional transfers, which give cash considering specific criteria (conditions), such as households with children, pregnant women or disabled members. On the other hand, PWs programs provide temporary employment to impoverished households by engaging them in labour-intensive activities, in exchange for cash wages (Yahie, 1993).

Tanzania has also been implementing welfare programs since 2000, under the project known as the Tanzania Social Action Fund (TASAF). TASAF has evolved into different forms due to challenges experienced from one phase to another (URT, 2013). For instance, phase three (TASAF III) in 2013 introduced the productive social safety net (PSSN) program. The PSSN comprised sub-components including an integrated package of both CCTs and PWs programs in different project area authorities (PAAs). In some of the PAAs, both CCTs and PWs were integrated; whereby the same households received earnings from both programs (Wong, 2012; URT, 2013; NBS, 2016). PSSN intended to promote "income-earning opportunities and socio-economic services for targeted poor households while enhancing and protecting the human capital of their children" (provide a page number for this direct quote) (World Bank, 2020; Green, 2021). PSSN targeted extremely low-income households (living below the basic need poverty line of TZS 36,482.5 per month in 2012) for food security, protecting physical assets, and helping households experiencing shocks (TASAF 2013; NBS, 2016). Participants in the Public Works program receive up to TZS 37,500 for 15 days of work per month, for a total of four months per year, resulting in a total household

income of TZS150,000 annually. Correspondingly, recipients of the Cash Transfer programs can receive a maximum of TZS 38,000 per month, distributed bi-monthly over the course of a year, amounting to TZS456,000 household earnings per year (URT, 2013; NBS, 2016).

Despite the initiatives of the Government of Tanzania toward attaining the SDGs 2030 (no poverty), around 3.5 million (9.7%) Tanzanians suffer extreme poverty (live below the food poverty line of TZS 33,748 or US$15 per month).[1] The well-being of the people in rural areas remain poor: of whom 31.3% of households are poor, compared to 26.4% of overall basic need poverty of Tanzania (living below the basic need poverty line of TZS49,320 or US$22 per month) (World Bank, 2020). However, the effects of CCTs and PWs programs on income generation has not been explored. This paper argues that the cash being provided to the poor households is available in intervals and fail to sustain continuous consumption. In other words, the amount provided is not distributed throughout the period from the time of payment to the next payment. To address the resultant problems, a part of the cash received could be invested, and the skills acquired from participating in PWs put into production so as to generate income for future spending (Daidone et al., 2014; Nirere, 2022).

The evidence shows that both CCTs and PWs have been successful strategies for increasing consumption, improving children's education, and lowering child labour among the poor and marginalized communities (Kabeer and Waddington, 2015; Green, 2021). Studies in some countries revealed that CCT programs have been effective in reducing short-term poverty and increasing the use of education and health services (Rawlings, 2005; Son, 2008; Fiszbein, Schady and Ferreira, 2009). PWs constitute an important type of safety net program for reaching the poor throughout Africa, through their participation in labour-intensive activities where they are paid wages, and thereby supplementing their sources of income (Adato et al., 2004; Evans et al., 2014; Gehrke and Hartwig, 2018). Several studies suggest that cash transfer programs can help households not only survive but also improve their livelihoods by investing a portion of the cash transfers they receive (Bastagli et al., 2019; Gehrke and Hartwig, 2018; Gertler et al., 2016; Grosh, 2008). However, there are also studies that have revealed negative impacts of cash transfer programs on beneficiaries (Rawlings, 2005; Son, 2008; Davis *et al.*, 2016). More recently, a number of analysts (Bastagli *et al.*, 2019; Daidone *et*

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[1] Exchange rate: 1USD = TZS 2250 (WB, 2020)

al., 2019; Nirere, 2022) have argued that promoting long-term welfare through consumption or income-based assistance programs is challenging and may lead to undesired outcomes. This has pushed for the need to integrate CCTs and PWs toward income-generating activities among program beneficiaries (Plumstead, 2012; Weisbrod & Weisbrod, 1997). Some scholars have pointed out that consumption smoothing is one of the long-run impacts, which requires constant access to goods and services. Hence, cash earned from the program has to increase opportunities for further income generation (Fiszbein and Schady, 2009; Pozarny and Davis, 2015; Daidone *et al.*, 2018; Bastagli *et al.*, 2019). In order to graduate from poverty, program participants are expected to invest and expand their income from a variety of areas. Income generation could enhance the poor households' access to food security, protection of their assets, and overcome economic shocks (Satumba, Bayat and Mohamed, 2017; World Bank, 2020; Satumba, 2023). This will guarantee higher income creation for smoothing consumption.

The purpose of this paper is to estimate the income impacts of safety net programs on household welfare in Tanzania. Specifically, it seeks to determine whether the cash received from both CCT and PW programs promotes income-generating activities at the household level. Furthermore, it conducts an analysis on the spending behaviour of program beneficiaries toward savings, and the types of income activities they engage in. The findings fill a gap in the existing literature on the economic welfare impacts provided by welfare programs in Tanzania. The study also provides a better understanding of the linkage relationship between integrated CCTs and PWs programs and income-generating activities in rural areas of Tanzania towards poverty eradication.

The rest of the paper is organized as follows: Section 2 provides a literature review, Section 3 describes the methodology, and Section 4 offers and discusses the study findings.. The conclusion and policy implications are are addressed in Section 5.

2. Literature Review

Safety net programs should promote productivity, growth, and lift households out of poverty (Adato, et al., 2004; Daidone et al., 2019; Grosh, 2008). Moreover, this linkage between cash transfer programs and income generation is built from the economic theory of 'safety net expenditure allocation'; that is, there should be marginal benefits, including improvements in equity, and increase in household welfare via investment or

improvement in risk management (Gruber, 2016). That is, to ensure smooth consumption, poor households should be able to comply with the Friedman's (1957) permanent income hypothesis and the life cycle hypothesis. Friedman's hypothesis states that consumers' " level of spending is determined by the expected future income" (provide a page number for this direct quote). The life cycle hypothesis, on the other hand, is related to income generation as it is based on the notion that households will attempt to smooth their expected consumption over the course of their lives and maximize the benefits of consumption from both current and future consumption, as well as assets to be left behind from savings (Modigliani, Abel and Johnson, 1980; Liu and Hu, 2013). Also, as argued by Gruber (2013), based on the assumption that CCTs and PWs have improved the capacity of poor households by strengthening self-insurance and smoothed consumption through investments, labour supply growth, and savings.

The income impact of welfare programs is also of interest as it was introduced into impact evaluation by the 'From Protection to Production' research project aiming to support and systemize lessons from the impact evaluation of cash transfers in sub-Saharan Africa (Daidone et al., 2014, 2018, 2019). Income impacts may be viewed in terms of business output (volume of sales), value added, wealth (including property values), personal income (including wages), or jobs (Weisbrod and Weisbrod, 1997; Plumstead, 2012). In addition, Plumstead (2012) suggested that any of these measurements could be a sign that households' economic well-being are improving, which is typically the main objective of economic development initiatives. Furthermore, in their studies of productive impacts in SSA, Daidone, Davis, and Dewbre (2014) and Pozarny and Davis (2015) developed the hypothesis that the productive effects of cash transfer programs at the household level are indicated by a set of four productive indicators: agricultural produce, agricultural inputs and assets, labour supply, and risk management.

CCT and PW programs have been implemented separately in different welfare programs in the world, with one common feature: to supplement household income (Bastagli et al., 2019; Grosh, 2008; Satumba et al., 2017; Yahie, 1993). Households' income in rural areas is derived from farming activities, livestock keeping, labour supply for wage and from non-farm businesses (Pozarny and Davis, 2015). The analysis of the effects CCTs and PWs programs is predicated on the idea that aside from driving up consumption, the little money obtained from the programs is invested in

productive projects (Daidone et al., 2018; Kabeer & Waddington, 2015). However, income generation outcomes are not regularly seen in many countries implementing CCTs and PWs programs (Bastagli et al., 2019; Daidone et al., 2019; Pozarny and Davis, 2015). For instance, Pozarny and Davis (2015) reported that few welfare projects (for example, 9 out 17 welfare projects supported by the World Bank) impacted positively on certain productive indicators, while other programs did not.

Growing evidence indicates that cash transfer programs can help household not only subsist but also actually improve livelihoods by investing a portion of the transfers they receive (Bastagli et al., 2019; Gehrke and Hartwig, 2018; Gertler et al., 2016; Grosh, 2008). The cash transferred to household through participating in public works programs can achieve the long run welfare of households through different investment channels. According to Grosh (2008), for example, PWs programs through road improvement projects led to 27% increase in agricultural wages and 11% increase in per capita consumption in Bangladesh. Also, studies conducted in SSA to analyse the impact of social cash transfer programs on the household economy, showed that cash transfers encouraged income-generating activities such agricultural investment, hiring of labourers, etc. (Pozarny and Davis, 2015; Davis *et al.*, 2016). Other evidence in Malawi shows that agricultural assets such as ownership of hoes increased by 16% and livestock such as goat ownership increased by 52% (Bastagli *et al.*, 2019) due to cash transfer programs.

The effects of safety net programs on income are influenced by various factors, including the quantity of transfers, the regularity of payments, and the specific objectives achieved (Mutelevu and Kayunze, 2014; Bastagli et al., 2019). A study conducted in Sub-Saharan Africa (SSA) found that cash transfers in Zambia provided relatively large lump sums, led to significant increases in productivity compared to other countries, such as the program in Ghana that exhibited few direct impacts on productive activities (Daidone et al., 2018, 2019).

As revealed by scholars, most income-generating activities affected by the CCTs programs were observed from different programs. In SSA, CCTs had a positive relationship with the growth of non-farm business activities (Pozarny and Davis, 2015); in Zambia, cash transfers reduced the labour wage and increased non-farm businesses by 17%, with large magnitude of monthly earnings (Daidone et al., 2019). The LEAP program in Ghana had fewer direct

impacts on productive activities and was more directed toward risk management (Daidone et al., 2019). Furthermore, casual labour has been a major source of income among asset-poor households, although it has been viewed as a measure of 'last resort' (Daidone, Davis and Dewbre 2014; Pozarny and Davis, 2015) as beneficiaries reduce casual labour and instead work more on their farms as well as engaging in non-farm businesses (Daidone et al., 2019). Evidence shows that the program's productive impacts resulted because cash received from CCTs was used to buy farm inputs. For example, in Zambia, cash transfers increased the share of household purchasing inputs by 18%, especially seeds, and the same impact was observed in Lesotho (Daidone et al., 2019).

Furthermore, PWs constitute an important type of safety net program for reaching the poor households through participation in PWs program, who are paid wages and thus supplements their sources of income (Adato et al., 2004; Evans et al., 2014; Gehrke & Hartwig, 2018). The PW programmes can have a variety of effects on productive activities and hence the welfare among poor households. PW programmes offer on-demand employment, which enhances participants' risk management and boost productive investments. Productive investments can spark to PW participants through acquisition of agricultural assets, raise capital for business, or investments in human capital (Davis *et al.*, 2016; Mussa, Agegnehu and Nashakira-Rukundo, 2022). PWs create new jobs and also results in salary or wage increase. Some PW programmes contain an implicit or explicit training component that may have an impact on participants' ability to generate revenue and consequently, improves welfare. Having access to a PW programme, households would raise their ability to manage risk, which in turn might increase their desire to make profitable investments. Generally, the PW programmes increase participants' discretionary income and ability to save money and eventually invest it in productive endeavors (Gehrke and Hartwig, 2018). Furthermore, a study by Kuria and Wanyoike (2016) found that PWs provided temporary employment in Kenya and that the beneficiaries lacked job opportunities for re-employment around their community once the projects ended. A review on productive effects of PWs (Gehrke and Hartwig, 2018) argued that although PWs can increase wages, but impact negatively on labour markets and they are costly. The studies revealed that PW programs do not increase employability as expected due to limited skills development (Adato, Ahmed and Lund, 2004; Gehrke and Hartwig, 2018; Satumba, 2023). However, PWs can stimulate productive investment via income and insurance effects when

the program is adequately reliable in the long term (Gehrke and Hartwig, 2018).

Correspondingly, cash transfer programs had negative effects. They created too much dependence among the beneficiaries, as they had to wait for the grants and go through a borrowing process that led to indebtedness. As a result, very little or nothing was saved (Rawlings, 2005; Son, 2008; Davis *et al.*, 2016). Myamba and Grimard (2017) conducted a study on women's empowerment in Tanzania that also revealed that cash transfers may lead to dependence, reduced engagement in productive work, and increased leisure. Furthermore, livelihood and empowerment studies reported that cash transfers lead to the temptation to have more children and continue to be eligible for the program (Handa. et al., 2013; REPOA, 2019). The study on impact of TASAF before the PSSN program revealed that the amount of TASAF's grant received had negative impacts on household income. This implied that access to grants by vulnerable groups (VGs) did not help the vulnerable groups to reduce poverty (Mutelevu and Kayunze, 2014). Furthermore, most of the studies did not put emphasize on the combined impact of both CCTs and PWs and also most of the impact evaluation studies did not link program and household income generation. In Tanzania, the findings from the mid and end-line impact of both CCTs and PWs under the PSSN on the youth of Tanzania, apart from other benefits derived from the program, also revealed an increase in livestock ownership at household level (Evans *et al.*, 2014; NBS, 2016; UNICEF, 2018).

Some countries have integrated both CCTs and PWs programs to the same household intending to smoothen consumption and overcome economic shocks including Tanzania (TASAF, 2017; Daidone *et al.*, 2019; Palermo *et al.*, 2019). Thus, it is anticipated that household welfare will alter in a much more positive way if CCTs and PWs programs are integrated on the same poor households. However, there is limited evidence on the effects of the integrated CCTs and PWs toward income-generating activities among program beneficiaries. The income impact of welfare programs is also of interest as it was introduced in impact evaluation by the "*From Protection to Production*" research project to support and systemize lessons from the impact evaluation of cash transfers in Sub-Saharan Africa (Daidone et al., 2014, 2018, 2019). The income impacts may be viewed in terms of business output (volume of sales), value added, wealth (including property values), personal income (including wages), or jobs (Weisbrod and Weisbrod, 1997; Plumstead, 2012).

Combined programs could have a wide range of additional economic effects, but their success varies significantly because they seem to depend on differences in program design and experience. Different countries have implemented CCTs and PWs with different features; the size of transfers, duration they had been provided, rural/urban, macroeconomic environment and infrastructure development (NBS, 2016; Bastagli *et al.*, 2019). Although recently scholars have begun to explore the potential income impacts of cash transfers, (Bastagli *et al.*, 2019; Daidone *et al.*, 2019; Alex, 2023) there is still a need for more comprehensive evidence.

3. Methodology
3.1 Study Area
The study was conducted in three regions (Kagera, Mwanza and Simiyu), specifically in districts implementing both CCTs and PWs under TASAF's PSSN programs from June to August 2020. These regions were selected because geographically they experience similar environmental conditions and similar economic activities. The selected districts include Misungwi, Itilima and Ngara from Mwanza, Simiyu and Kagera regions, respectively. The PSSN established Project Area Authorities (PAAs) using a pure randomization approach. In each region, one district was implementing the integrated PSSN programs, with some villages set under treatment and others as control (TASAF, 2017).

Therefore three districts from three regions based on program baseline information (NBS, 2016) were selected - Itilima District in Simiyu Region, Misungwi District in Mwanza Region, and Ngara District in Kagera Region. According to the 2012 national census (URT, 2016), the population of Itilima District was 313,900, covering a total area of 2,647.7 sq. Kms, of which 1,938.70 sq. kms is covered with arable land suitable for agriculture and livestock keeping, 69 sq.kms is covered by water streams, shallow bushes and a hilly area. The major economic activities of Itilima district are agricultural production and livestock keeping (more than 80% of the population). Food crops grown there include maize (main staple food crop), paddy, sorghum, sweet potatoes, cassava, beans, green grams and cow peas. Cash crops are cotton, sunflower and yellow grams. Furthermore, for Misungwi District as of the 2012 household census survey, the population was 351,607 and the major economic activities include; livestock keeping, fish ponds and fishing, farming, mining and manufacturing and trade. Ngara District had a total population of 320,056, with a coverage of 3305 sq. Kms, with 93.1% of the

Ngara population residing in the rural area (URT, 2016). Ngara is characterized by subsistence farming and animal rearing as the principal occupations. Major crops grown are bananas, beans, cassava, maize, and various vegetables. Also, cattle, poultry, and goats are the most common livestock among the locals. These districts were selected because they are all under the PSSN program implementing both CCTs and PWs and also their economic activities are almost similar, hence generating reliable information required for measuring the program impacts and generalizing the results.

3.2 Sampling and Data Generation

This paper uses household level data from a survey conducted on a sample of 357 households in the three districts drawn using a multistage random sampling technique from the sampled three regions participating in the PSSN program. The multistage random sampling technique was applied to obtain a sample of households from the randomly selected 35 villages. The total sample of 357 households, of which 175 households were selected randomly from 17 treatment villages and 182 households from 18 control villages. To obtain the sample, after selecting the regions, the districts were obvious as each region had only one district implementing the PSSN phase one. The study employed a cross-sectional research design, whereby quantitative data, with a guide from the World Bank's Living Standards Measurement Study Household Surveys (Grosh and Glewwe, 1998), were collected from the sample. The sample size was determined by using the Cochrach formula (Naing, Winn and Rusli, 2006);

$$n = \frac{z^2 p(1-p)}{e^2} \ (1) \tag{1}$$

Where, n is the sample size, z is a statistic for a level of confidence, at which data are tested where z takes the value of 1.96 for 95% confidence interval, e is the sampling error (level of precision), which was 5%, p stands for proportion of the population under the study from which data were generated, which is 50% for this study. By using the formula in equation (1), 357 households were sampled in the study area districts..

3.3 Econometric Models

This is a quasi-experimental study whereby econometric techniques to create a better counterfactual by removing pre-existing significant differences in key variables is required. A wide variety of non-experimental approaches exist in the literature, the most common of which are propensity score matching (PSM) methods as described by Rosenbaum (1983) are used to estimate the impact of

the program. Due to nature of the program, some programs apply other methods, the Livelihood Empowerment Against Poverty (LEAP) program in Ghana, due to practical considerations of the program, used a longitudinal propensity score matching (PSM) design (Davis *et al.*, 2016). PSM was used also in Zambia (Mahmoud and Thiele, 2013) and cases where panel data were not available and outcome variables were observed only at follow-up, a single-difference estimator (PSM) was used (Daidone *et al.*, 2019; Nirere, 2022; Tadesse and Gebremedhin Zeleke, 2022). However, other studies have used Difference in Differences (DiD) approach (Mdadila, 2017; Kinyondo and Magashi, 2019). The volume of papers edited by (Davis *et al.*, 2016) revealed a mixed approach, with some programs in certain countries (Lesotho, Malawi, Zambia) using DiD, while Kenya, Ghana and Ethiopia used both DiD and PSM, with the exception of South Africa, which used only the PSM approach to estimate the program impacts.

The PSM uses a linear combination of covariates to form a composite that can be used to balance the treatment and comparison group. PSM uses propensity scores, P(x) derived by probit or logit models to match the treated and control groups. The strength of PSM is that it allows a researcher to obtain a credible counterfactual when random assignment is not possible (Imbens, 2003; Caliendo and Kopeinig, 2008; Gertler *et al.*, 2016; Granger *et al.*, 2020). To measure the impact, the Average Treatment on the Treated (ATT) is estimated as in equation 2;

$$P(X_i) = P_r \ (T_i = 1| \ X_i) \qquad (2)$$

where, P_r is the probability of household i being treated, takes dummy values. T_i represents treatment status of household i (1= treated or 0 = Not treated) X_i represents a set of observed variables (vector of covariates) for household i.

Having the P(x) scores, PSM estimates the ATT as the mean difference in outcome of interest over the common support;

$$ATT = E_{P(x)|T=1}\{E[Y(1)|T = 1, P(x)] - E[Y(0)|T = 1, (P(x)]\} \qquad (3)$$

Where, *Y(1)* stands for the outcome of treated, and *Y(0)* for outcome of the control group.

The PSM estimator is obtained after matching the propensity scores using different matching algorithms. The commonly used matching algorithms are nearest neighbour, Radius or calliper, Kernel and Stratified matching

algorithms (Khandker, Koolwal and Samad, 2010). Different studies have used either all algorithms and discussed the results basing on less biased algorithm (Mdadila, 2017) while others use one of them, where the Nearest Neighbour (NN) is widely used (Mahmoud and Thiele, 2013; Granger *et al.*, 2020).

3.4 Quality Check of the PSM Estimators

According to Rosenbaum and Rubin's (1983) theorem, "after conditioning on propensity score estimates, $P(D=1|X)$, additional conditioning on variables (X) should not provide a new information about the treatment decision". The statement implies that if additional condition provides changes in estimates, the model is miss-specified and might reflect failure of conditional Identification Assumption (CIA). Granger et al (2020) argued that the propensity score model has to be correctly specified in order to avoid residual confounding bias. Therefore, the model should be properly and statistically diagnosed using different diagnostic tests (Zhang *et al.*, 2019). Therefore, different approaches are considered to ensure good fit of the model. Therefore, the t-values or p values are used in this study to check if there are significant differences in covariate means for both groups. Before matching, the difference in covariate means should be expected, but after matching, the covariates should be balanced in both groups and hence no significant differences should be found (Khandker, Koolwal and Samad, 2010).

4. Results and Discussion
4.1 Descriptive Results

Overall, the average income at the household level is TZS40,673.0 per month in the sampled households; with averages of TZS43,132.9 and TZS38,308.2 for the treatment group and control group, respectively (Table 1). These results mean that both groups (beneficiaries and non-beneficiaries) remain poor, as the average income earned per month is less than the basic needs poverty line of TZS49,320 (World Bank, 2020). The difference between the treatment and control groups is TZS4,824.6 in favour of the treatment group and is statistically significant at 10%. Generation of income at the household leve is influenced by other factors; including gender, household size, education, housing, occupation, geographical and assets owned (Son, 2008). The overall income is accumulated from the four major income activities mostly found in rural areas; farming, petty business, casual labour and livestock keeping. A notable positive significant difference of TZS7,079 is observed on petty business; that treated households are likely to engage and

generate more income from non-farm activities compared to households in the control group. Another notable result is a decrease of TZS1,925.1 to the treatment group's income earned from livestock keeping activities and it is significant at 10%. This results reverses the expected program impact. However, program beneficiaries reported death of livestock, which obviously resulted in a decline in income opportunities from livestock. This impact raises the need for capacity building toward livestock keeping among program beneficiaries.

However, there is a positive and statistically significant difference in ownership of livestock; treatment groups own 3.6% more cows, 35% more goats and 30.9% more chickens compared to control groups. A large number (64.24%) of program beneficiaries have significantly saved more than non-beneficiaries. This is because over 70% of women under the program are engaged in saving groups around their community (Table 1). As pointed out in previous studies, implementation of CCTs and PWs programs affected the labour markets; program beneficiaries tend to reduce working for wages in others' farms and instead work in their own enterprises. This could be the possible reason why the mean difference of labour income is not significant.

The programs aim to provide insurance for low-income households against economic shocks, preventing them from resorting to negative coping strategies like excessive borrowing that could impact their productive decision-making. It is obvious an indebted household will have to spend their earnings on paying back the loans obtained either due to sickness, student costs, and shortage of food. Households benefiting from the CCTs and PWs programs are expected to reduce borrowing steadily and strengthen self-insurance through savings and productivity. The results in Table 1 shows that debts of the beneficiaries, which are significant at 5%, decreased by TZS14,802 compared to non-beneficiaries, also consistent with other programs in SSA (Daidone et al., 2019).

Table 1: Descriptive Statistics of Indicators of Household
Welfare Before Matching

Variable	Treated Mean	Control Mean	Overall Mean	Mean Difference
Non-farm income (TZS per month)	10920	3840.7	7310	7079***
Farm income (TZS)	20657.14	19030.76	19828.01	1626.38
Livestock income (TZS)	1954	3879.12	2935.43	-1925.1*
Casual labour income (TZS)	8820	9786.81	9312.89	-966.8
Total income (TZS per month)	43132.9	38308.2	40673.3	4824.6*
Cow ownership (%)	8.57	4.94	6.72	3.63*
Goat ownership (%)	52.57	17.58	34.73	34.99***
Chicken ownership (%)	60.57	29.67	44.82	30.90***
Hoe (%)	76.57	79.12	77.87	-25.5
Panga/ slushier (%)	49.14	34.07	41.46	15.08***
Land (%)	28	23.63	25.77	4.37
Savings (%)	70.29	6.04	37.53	64.24***
Debt (TZS)	13,486	28,288	21032	-14802**
Household size	6.2171	5.5879	5.8964	0.6292**
Head below 18years (%)	1.71	1.65	1.68	0.065
Head between 18 & 35yrs (%)	14.28	8.24	11.20	6.04**
Head between 35 & 60yrs (%)	54.86	38.46	46.5	16.4***
Head above 60yrs (%)	29.14	51.65	40.62	-22.51***
Head not educated (%)	58.29	63.74	61.06	-5.45
Educated Head STD VII (%)	41.71	36.26	38.93	5.45
Educated Head IV (%)	0	1.1	0.56	-1.1*
Female is head of household (%)	77.14	71.43	74.23	5.72
Head is married (%)	56	33.52	44.54	22.48***
Observations	175	182	357	

Note: * P<0.1 **P<0.05 ***P<0.001
Source: Authors' findings

4.2 *The Influence of the Programs on Household Spending Habit*
The spending habit of the household after receiving the cash has to be assessed in order to create a link between the program and productivity. From Protection to Production project is built on the hypothesis described earlier that, cash

transfers should promote purchases of productive inputs while smoothening consumption. However, the level of inputs used determines the amount of income to be generated. Households received the benefits from the two CCTs and PWs programs in different periods such that the expenditure of each program payment can be assessed separately. Viewing the spending habit of cash received from CCTs, Table 2 gives the purchases of farm inputs, livestock and savings will directly determine the level of productivity of the program.

Table 2: CCT Spending Behaviour

Items bought after receiving cash from CCTs	Percentages (%)
Farm input (fertilizer, seeds, etc)	13.7
Livestock (cows, goats, pigs, chickens, ducks)	6.3
Foodstuff	73.7
Non-food (clothes, shoes, stationaries, bills, etc)	63.4
Savings (cash, groups, banks, etc)	21.7
Debt clearing	3.4
Durables (chairs, tables, bed, utensils, etc)	6.8

Source: Authors' findings

The descriptive results show that at least some of the CCTs beneficiaries were able to spend on farm inputs (13.7%); livestock (6.3%) and 21.7% saved cash in groups. However, higher spending on consumables, food and non-food (clothes, students' uniform, shoes, etc) meets the direct goals of the CCTs programs as they are established to smoothen consumption. PWs program provides a lump sum of money payments as wages to households participating in the program activities. The cash received from PWs is much higher compared to CCTs, and could be used for buying items that require higher amounts and a lump sum amount of money, like land, goats, cows, house materials, etc.

Table 3 presents the spending habits of PWs beneficiaries after receiving the payments. The results at least show that a large number of beneficiaries spend their cash on productive items; 57.14% on livestock, 8% engaged in non-farm business, 32.57% were able to apply the skills on their home activities and 12% bought farm inputs.

Comparing the spending behaviour of CCTs and PWs programs, CCTs payments are likely to be spent more on foodstuffs (73.7%) compared to 28% of PW payments. At the same time, households receiving PWs payments tend to spend more on livestock (57.14%) compared to very few (6.3%) households earning CCTs. However, much more could be realized if PWs programs were

sufficiently reliable and long term sustained (Gehrke and Hartwig, 2018). Therefore, the two programs being implemented together give the beneficiary alternatives to allocate the earnings received.

Table 3: PWs Spending Behaviour

Item bought after receiving PWs wages	Percentages (%)
Farm input (fertilizer, seeds, etc)	12
Livestock (cows, goats, pigs, chicken, ducks)	57.14
Foodstuff	28
Non-food (clothes, shoes, stationeries, bills, etc)	18.2
Durables (chairs, tables, bed, utensils, etc)	7.4
Dwellings (iron sheets, cement, tiles, bricks, etc)	32
Land	16.57
Non-farm business (fish, vegetables, crafts, local beer, etc)	8
Applied acquired skills	32.57

Source: Authors' findings

4.3 Regression Results

To obtain the propensity scores, a probit model was first estimated. With a binary dependent variable capturing the treatment status; where it takes value of 1 if the household received the treatment (treatment group) and 0 if the household did not receive the treatment (control group). For this study, the outcome of interest is household income and treatment are both CCTs and PWs programs. The analysis required establishing the best-fit model and predicting the reliable propensity scores. To obtain reliable propensity scores (Khandker, Koolwal and Samad, 2010), different measures were considered, including covariates choice, ensuring common support, balancing property and Conditional Independence Assumption (CIA).

Table 4 shows the regression coefficients derived from the logistic model. The covariates chosen includes variables such as housing characteristics and the time invariant household characteristics. These covariates satisfy the requirements for running the logistic model to estimate the propensity scores. Some of these observed covariates have been used by different researchers to balance between treated group and control group when estimating propensity scores. Kamakura and Mazzon (2015) and Mdadila (2017) used geographical area, interacted gender and marital status, grouped ages of individuals as well as education categories. In addition, Mdadila (2017) also included gender, household size,

marital status, assets, education and sanitation to estimate propensity scores. Variables chosen depend on the kind of study undertaken as long as they meet the conditions explained (Khandker, Koolwal and Samad, 2010).

Table 4: Logistic Model on Household Receiving both CCTs and PWs Benefits

Variables	Coefficient
Size of household	0.032
Household own house 2015	-0.035
Wall made of burnt bricks/ blocks 2015 =1	-0.059
Iron roofed 2015 =1	-0.422***
Cement flooring 2015=1	0.183
Members per room 2015	0.018
Improved toilet 2015 =1	0.284
Improve cooking technology 2015 =1	0.788
Improved light energy 2015 =1	-1.32***
Improved water sources 2015 =1	0.08
Access to health insurance 2015=1	-0.616*
Gender of head =1	0.291*
Head not educated =1	-0.029
Head below 18yrs =1	0.045
Head above 35yrs but below 60yrs =1	-0.528**
Head aged above 60yrs =1	-0.924***
Constant	0.241

Note: * $P<0.1$ **$P<0.05$ ***$P<0.001$
Source: Authors' findings

Furthermore, significant results up to 10% are observed on baseline covariates including; iron roofed house, improved lighting energy, health insurance, female headed household, household head aged above 35years and also household head aged above 60 years. Households that own a house, iron roofed, with improved lighting energy, health insurance, aged above 35years and also aged above 60 years had less probability to be placed in the program (treatment group). Households headed by a female, below 18 years, without improved cooking technology and highly populated, had a higher probability of receiving treatment.

4.4 PSM Impact Results

The household income impacts are estimated basing on different sources of household income separately and the overall household income in total comparing the treated and control groups at household level. Each of these estimates were carried out separately by different PSM algorithms. The idea was to establish which of the matching method provided less biased PSM estimators (Austin, 2014). The estimate of interest is the ATT. Except nearest neighbour matching, the rest (Karnel, Stratified and Calper matching algorithms) yielded almost similar results my matching 175 households from the treatment group with 160 households from the control group. According to Austin, Caliper or Radius matching algorithm is less biased, thus will be used in this study when discussing the value of ATT.

Furthermore, the impacts on income earned by household under the program were estimated with PSM algorithms (Table 5). Results generally suggest for a non-significant effect of both CCTs and PWs programs on average total household income. The total household income is derived from a summation of the income sources including non-farm business, farm output, livestock products and labour wages. A notable significant treatment effect has been seen on the income earned from non-farm activities involving petty business and craftsman,, where household access to both programs significantly increased the non-farm income of the household by about TZS5,500 per month (on average of the matching methods).

Table 5: Impact of the Programs on Different Sources of Household Income

Sources of Income	NN Matching ATT	Kernel Matching ATT	Stratification Matching ATT	Radius r caliper Matching ATT
Livestock	-2091.714	-2469.884	-3081.805	-2097.187
	$(t=-0.911)$	$(t=-1.388)$	$(t=-1.516)$	$(t=-1.172)$
Non-farm	3394.286	5741.216*	5959.076*	5096.040*
	$(t=1.096)$	$(t=1.956)$	$(t=2.494)$	$(t=2.261)$
Farming	4720.000	794.682	1091.214	530.683
	$(t=1.131)$	$(t=0.208)$	$(t=0.345)$	$(t=0.174)$
Labour	-4162.857	-2421.748	-2454.926	-2233.536
	$(t=-1.209)$	$(t=-0.739)$	$(t=-0.818)$	$(t=-0.903)$
Overall	1996.857	1164.825	1156.241	162.004
	$(t=0.396)$	$(t=0.362)$	$(t=0.338)$	$(t=0.045)$

Note: * $P<0.1$ ** $P<0.05$ *** $P<0.001$

Source: Authors' findings

Despite the average non-farm income change being statistically significant, the average difference in the amount of TZS5,500 per month is small compared to the expectation of the study. The increase in household income is small and may not contain the economic shocks and market fluctuations that in turn might take a long time to move out of the poverty trap. The non-farm businesses that are seemly significant but are the major income-generating activity are not sustainable. Most of these businesses are small and labour-intensive, with low returns and fluctuating capital depending on the sales and other factors. For the program to uplift the poor household under the program to graduate from poverty, more income has to be generated compared to non-beneficiaries. Similar impact results were revealed by a study conducted in seven SSA countries (Davis *et al.*, 2016) and a World Bank study (Wong, 2012).

4.5 Program Impact Basing on Case Analysis

However, when narrating the income generation impacts at individual bases, there were few households that presented big improvement in their well-being and income generation. For example, a household at Inalo village in Lugulo ward, Itilima District in Simiyu Region was able to build an iron-roofed house, walls made of block bricks with three rooms and flash toilet. Also, the same household owns home assets such as radio, mobile phone, bicycle and chairs as well as livestock assets (three chickens). The household is engaged in business and is able to generate around TZS100,000 per month from a business and TZS10,000 per month from house rent. This household was able to do all this by considering the program intervention as an opportunity; she used the cash received from PWs to buy building materials and set some as capital for the business while using CCTs cash for consumption and student costs.

Another household to learn from was in Nanga village in Chinamil ward from Itilima District in Simiyu region. Before the program, she was renting a house and after the program, she had built an iron-roofed house with three rooms and also owned solar for lighting. She also owned assets; mobile phone, bicycle, chairs, two cows and five chickens. Under the PW program, the household used the lump sum cash received to buy building materials such iron sheets and bricks, as well as to pay rent on the "*shamba*" for farming activities and for business capital. The household is able to generate TZS20,000 by selling sardines "*dagaa*" and an average of TZS80,000 from farm produce, for a total of TZS100,000 per month.

Additionally, one of the program's recipients in Mwaniko village in Misungwi, Mwanza, was able to upgrade her home by expanding it from two to four rooms, switching out the mud floor for cement, and replacing the grass roof with iron sheets. She also purchased a mobile phone, a bicycle, four chairs, two goats, and four chicks with the money she received from the program. She also installed electricity in her home. She has a modest business selling fish, which earns her an average of TZS60,000 per month, despite the fact that she has spent money on house modifications and asset replacement.

With these few examples, a lesson learnt is that, protection programs could change the well-being of poor households when utilized appropriately. PWs do provide a lump sum amount of money, which could buy expensive goods (requiring lump sum payments) like iron sheets, bicycle, furniture, building materials and livestock (goats and cows). However, ensuring food security through farming activities brought up their success. These households have harvests, some reserved for food and other crops are on the farm. For example, one household declared seasonal production of 10 bags of maize, 2 bags of groundnuts, 4 bags of paddy and other food crops such as sweet potatoes and vegetables were on the farm. Also, another household had harvested 4 bags of maize and 3 bags of groundnuts.

4.6 Discussion

From descriptive statistics and the matched results, households in the treatment group seems to own more livestock especially goats and chickens (Table 2) compared to those in the control group. The study was expecting households under the programs to generate more income from livestock compared to non-participants as revealed by Handa *et al.(*2013) in Zambia. The study argues that, households in the intervention do not sell livestock products (eggs, milk) to earn income, neither do they sell their livestock. Instead, they keep their livestock to increase in number and use their products to supplement their food composition, which is also a desired long-term impact as in future, more income would be earned.

Again, like cash transfers in SSA, they have impacted positively on accumulation of agricultural assets like hoes, farm inputs and more agricultural produce (Pozarny and Davis, 2015; Davis, 2016; Daidone *et al.*, 2019). Together with accumulation of agricultural assets, this study also estimated the impact differently, by estimating the money income earned from farming activities. The results are not significant up to 10% for all

matching methods, implying that both households under the program and the non-participants almost earns the same income. The impact of CCTs and PWs programs on income from farming activities is not significant for both unmatched (Table 2) and matched results (Table 5), which align with the insignificant results on land ownership for farming activities. Theoretically, the intervention of CCTs and PWs in the economy of the households since 2015 up to 2020, much changes in terms of economic activities were expected. One of the aims of the program was to protect households against economic shocks and keep their assets. Among the assets, agricultural assets include farm inputs and livestock, which are major sources of capital for income generation in rural areas. To the contrary, the results in the study did not find the significant changes among the two groups, program beneficiaries and non-beneficiaries.

However, household involved in the programs earns less income (around TZS2,000) from casual labour compared to non-participants. Cash transfers have enabled beneficiaries to reduce casual labour and work more on their own economic activities such farming, livestock keeping and petty businesses (Evans *et al.*, 2014; Myamba and Grimard, 2017). Many program beneficiaries are engaged in their own activities like petty businesses instead of engaging in casual labour for others. These results reflect Pozarny and Davis's (2015) study on the impact of social cash transfer programs; that casual labour is viewed as "a measure of last resort" of insurance. The results (Table 1) show that participants were able to earn TZS10,900 while non-participants earned TZS3,800 from non-farm activities, and mostly engaging in petty businesses. Viewing the scenario from the other dimensions, most of the program beneficiaries are old and are no longer in the labour force. Therefore, they do not offer labour but instead expect to survive only by the program payments. While other households became reluctant to work as they expect earnings from the program. This is contrary to the intention of the PSSN II project. Beneficiaries from the program should increase opportunities for income generation leading to poverty graduation (WB, 2019).

However, a lesson was learnt from a few selected successful households. Households engaging in petty businesses and farming activities by using earnings from the program to buy farm inputs were able to increase harvests and hence earn more income. Their living standards improved in terms of housing conditions and levels of consumption, as well as average monthly

income generated. Spending habits and diversification of income activities by households could contribute to program..

5. Conclusions

This study intended to evaluate the impact of both CCTs and PWs on household income as a way out of poverty. The study analysed the income-generating activities commonly carried out in rural areas such as farming, livestock keeping, non-farm business and casual labour. Among the four major income-generating activities, only non-farm businesses responded positively to the intervention. It should be noted that farming and livestock keeping are the major economic activities in rural areas. However, the changes in income from non-farm activities resulting from the programs are not sufficient to move the poor household from the poverty trap. The increase in household total income is small and may not sustain the economic shocks and market fluctuations that in turn might take long time to move out of the poverty trap. Economically, the program intervention did not bring a significant impact on household income as expected. Instead, the programs provided income for subsistence and upkeep for the households such that little or none, was left for productivity and future income earning in general.

Due to the impact differences observed in spending habits of the earnings from CCTs and PWs, the study recommends that program planners and policy makers impose conditions on the households that will force them to allocate their earnings toward productive investment, especially the PWs earnings. Again, program planners should encourage more extension of the PWs and more frequent availability, as suggested by Gehrke and Hartwig (2018). This is due to the fact that few PWs were implemented (only two projects in a year) contrary to the programs' planned frequency of at least four times (four projects) throughout a year during the lean season. Furthermore, productive conditions should be embedded in the program such as encouraging farming, livestock keeping as well as group savings.

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