IMPACT OF CONDITIONAL CASH TRANSFER ON POVERTY REDUCTION IN SUMBAWANGA MUNICIPALITY, TANZANIA

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF ARTS IN PROJECT MANAGEMENT AND EVALUATION OF SOKOINE UNIVERSITY OF AGRICULTURE. MOROGORO, TANZANIA.

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EXTENDED ABSTRACT

Conditional Cash Transfer (CCT) has been recognized to reduce poverty in Tanzania. However, there is scant information on the impact of conditional cash transfers on beneficiaries' food security, health and education status within the household. This study aims to evaluate the impact of conditional cash transfers on beneficiaries' food security, health and educational status within the household in Sumbawanga Municipality. A cross-section research design was adopted. The sample size used was 450 households with 171 households as the treated group (beneficiaries) and 279 households as the control group (non-beneficiaries). Quantitative data were obtained from a household survey and analysed by using propensity score matching with the aid of STATA 14. The study findings show that on average conditional cash transfer programmes have significant effects on improving households' food security by increasing food consumption by 47 percent, reducing adverse coping strategies by 59 percent, increasing access to health services by 70 percent and increasing school attendance by 32 days more than non-beneficiary children. The study recommends that the Ministry under the President's office Public Services Management and Good Governance through the CCT programme increase beneficiaries and the amount of basic cash given to poor households with higher household sizes and the Government, Non-Government Organizations and other stakeholders should work together with the CCT programme to continue to improve food security, education and access to health services in the study area.

DECLARATION

I, MARIAM DAVID KISIWA do hereby declare to the senate of Sokoine University of Agriculture that this dissertation is my original work done within a period of registration and that it has neither been submitted nor being concurrently submitted in any other institution.

……. **…….**

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The above declaration is confirmed by,

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DEDICATION

I dedicate this work to my almighty God and my family who have allowed me to engage in this study.

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LIST OF ABBREVIATIONS AND ACRONYM

ATT	Average Treatment on Treated
CCT	Conditional Cash Transfer
CHF	Community Health Fund
CM	Caliper Matching
CSI	Coping Strategic Index
FAO	Food and Agriculture Organization
FCS	Food Consumption Score
FYDP	Five Years Development plan
HBS	Household Budget Survey
IDA	International Development Association
KM	Kernel Matching
MA	Master of Arts
MMM	Mahalanobis Metric Matching
NGO	Non-Government Organization
NNM	Nearest Neighbouring Matching
PSM	Propensity Score Matching
SDGs	Sustainable Development Goals
SM	Stratification Matching
SMC	Sumbawanga Municipal Council
STATA	Statistical Software for data science
SUA	Sokoine University of Agriculture
TASAF	Tanzania Social Action Fund
TDV	Tanzania Development Vision
UN	United Nations

UNDP	United Nations Development Programme
URT	United Republic of Tanzania
WFP	World Food Programme

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

Poverty is the state in which an individual cannot meet his or her basic needs for life. Failure to meet basic needs can lead to decreased access to health facilities, literacy rates and quality of life (Pelizzo *et al.*, 2018). Moreover, Melio (2015) describes poverty as a condition in which people or communities lack financial resources and essential requirements such as clothing, nutritious and adequate food, housing, health services and clean water for a minimum standard of living. Access to basic needs is measured by welfare indicators and they differ according to different localities. These indicators include household average food and non-food consumption, electricity connectivity, water and energy use, toilet facilities, housing conditions, household size, income inequalities, and ownership of a bank account (URT, 2019). Poverty can also be manifested as income poverty and food poverty among the poor. Poverty reduction includes the redistribution of opportunities, assets and incomes with the provision of social protection to poor households for economic development (Pelizzo and Kinyondo, 2018). Generally, poverty reduction is a procedure or technique that can be done by the government or non-government to remove poor people permanently from poverty by supporting economic growth and improving basic services.

Poverty reduction needs a set of government initiatives to be alleviated and make poor and vulnerable households have better living standards. Among the initiatives for reducing poverty is the application of social protection in which poor and vulnerable households are served with income for managing basic needs (Devereux, 2016; Azeem *et al.*, 2019). From that perspective, the Tanzania government takes an initiative to support poor households to graduate from extreme poverty by establishing social protection (URT, 2016a).

The government intended to break the poverty circle by establishing social protection because poor households tend to pass on their poverty status to their children.

The Government of Tanzania with World Bank assistance established the Tanzania Social Action Fund (TASAF) in 1999 as a basic mechanism for poverty alleviation. Since then TASAF has been implemented in three consecutive phases (TASAF I, TASAF II, and TASAF III). TASAF I was implemented between 2000 and 2005 in 40 districts of Tanzania Mainland and Zanzibar and was based on infrastructure development such as the construction of simple bridges, schools, health centres and roads (URT, 2005). Furthermore, TASAF II was implemented in all District Councils, Municipalities and Town Councils in the country from 2005 to 2009 and it focused on resolving the lack of social services and income poverty (URT, 2005). Thereafter, TASAF III was initiated by the government of Tanzania with the main objective of enabling needy households to enlarge their incomes and opportunities while improving their food and non-food consumption through Conditional Cash Transfer (CCT) (URT, 2013). The programme is supported by the Government of Tanzania and the International Development Association (IDA) (URT, 2013).

The CCT programme is an increasingly popular social protection mechanism used to alleviate poverty in many developing countries. The conditional cash transfer programme provides cash to poor households with conditions for spending on food, health services and education of their children. These conditions include regular visits to clinics for younger children and pregnant women for checkups and taking vaccinations (Owuso-Addo *et al*., 2018). According to URT (2013), the CCT programme has two types of cash transfers; basic unconditional transfers that are given to all targeted poor households to ensure basic support and conditional cash transfers which are intended to improve human capital in education and health. The main purpose of conditionality in the programme was to improve

the human capital outcomes and encourage the long-term impact as well as strengthen the poverty reduction programme (Bastagli *et al.,* 2016). In this study, poverty reduction focused on improved basic services such as access to health services, education of children and food security for poor households in the study area. Moreover, human capital investments are defined by improved access to health services and education.

The study by Palmeira *et al*. (2019) reported that cash transfer has an impact on a household's food security as the extra money given to beneficiaries can be used in agricultural activities or other income-generating activities which generally can increase the household income that can be used to increase the chance of food access. Furthermore, there is clear evidence that the use of conditional cash transfers on average half of it is used for food, one-third on household expenses and the remaining on health, education or other investments (Mohammdi, 2019). On the other hand, the programme improves the educational outcomes of poor households at different levels of society. Evans *et al*. (2020) demonstrated that in Tanzania, the programme improves the educational outcomes for vulnerable children but at different levels of distribution. As such, it increases the chances of school attendance for very poor children while increasing the chances of school completion for less poor children. Furthermore, the goals of cash transfer are to improve human capital, food consumption and the health status of poor households. Evans *et al*. (2019) proved that cash transfers in Tanzania managed to increase the uptake of health insurance and increase under five-year-old clinic attendance which reduces the number of sick days of the members of the household.

Despite the efforts made by the government and the evidence from scholars about conditional cash transfer for poverty reduction still, Tanzania has a relatively high poverty rate whereby the proportion of people living below the national basic needs poverty line of

TZS 49 320 per adult per month is 26.4 percent (URT, 2019). Moreover, the occurrence of poverty was higher in rural areas (31.3%) than in urban areas (15.8%) while it was highest in the Rukwa Region (45.0%) and lowest in Dar es Salaam Region (8.0%) (URT, 2019). Furthermore, URT (2019) shows that 8 percent of Tanzania's population falls below the food poverty line (extremely poor). The Rukwa Region has the highest food poverty of 19.8 percent and was the lowest in the Kilimanjaro region (2.1%) (URT, 2019). Despite the Tanzanian government's efforts to reduce poverty in the country, the Rukwa Region remains the poorest region with a poverty rate of 45 percent and a food poverty rate of 19.8 percent. This study calls attention to the need to assess the impact of conditional cash transfers on food security, health and education status among poor households in the Sumbawanga Municipality, Tanzania.

1.2 Problem Statement and Justification for the Study

Poverty in the Rukwa Region in which the Sumbawanga Municipality is located was reasonably high. The National Household Budget Survey (HBS) of 2017/2018 indicates that the incidence of poverty was highest in the Rukwa Region (45%) and food poverty was 19.8 percent (URT, 2019). The launching of TASAF projects in the Sumbawanga Municipality was counted among the efforts to reduce poverty in the study area. Through its component of a productive social safety net, CCT provides households with cash to purchase food, pay for medical care and encourage school attendance and curb food insecurity in the area. It has been noted by Daidone *et al*. (2019) that an effective programme designed to reduce poverty among poor households was the provision of cash transfers that can promote the reduction of poverty per amount of cash transferred. Thus, this study finds it interesting to analyze to what extent households were re-investing the cash transferred to them on social safety net services and to check if there was any difference in the use of adverse coping strategies as a

way of mitigating the effects of food shortage at the household level between beneficiaries and non-beneficiaries.

Based on the background information and problem statement, information obtained from this study will help planners, policymakers and development partners to understand appropriate strategies among poor households that could be needed in addition to conditional cash transfer or to improve other non-financial support to reduce poverty in the country. Moreover, the study was corresponding with the first Sustainable Development Goal (SDGs) of ending poverty (UNDP, 2019). The goal aims to reduce by half the proportion of women, children and men of all ages living in poverty in all its forms by 2030 (UNDP, 2019). Furthermore, the study is matching with the Tanzania Development Vision (TDV) 2025 objective of achieving high-quality livelihood that depends on sustainable and growth development with reduced abject poverty (URT, 2000). In addition, the study aligns with the Tanzania Second Five Year Development Plan 2016/17-2020/21 (FYDP II), i.e. the pillar of human development which emphasizes supporting economic growth and promoting the quality of life and living standards of the people by 2025 (URT, 2016b).

1.3 Objectives

1.3.1 Overall objective

To examine the impact of conditional cash transfers on poverty reduction among Sumbawanga Municipality's poor households.

1.3.2 Specific objective

1. To assess the impact of conditional cash transfers on poor households' food security.
2. Evaluate the impact of conditional cash transfers on the education and health of beneficiaries.

1.3.3 Research Questions

1. How does the CCT received by poor households in the Sumbawanga Municipality help to improve their food security?
2. Are the CCT recipient's households better off in terms of their health and education status?

1.4 Theoretical Framework

This study is guided by the theory of change in cash transfer (Bastagli *et al*., 2016). The theory of change explains the mechanism and ways that conditional cash transfer interventions are used to reduce poverty through improving human capital. The theory argues that cash transfers at the community level can contribute to changes in the economy and social networks through well-designed implementation factors such as targeting, level of transfer, payments systems and associated conditionality (Bastagli *et al*., 2016). The main purpose of conditionality in the programme is to improve human capital outcomes and encourage long-term impact (Millán *et al*., 2019).

The cash transfer is aimed at improving immediate, intermediate and long-term outcomes. Cash transfer increases the achievement of immediate outcomes such as access to food, services like education, health and transport, intermediate outcomes like school enrollment, attendance, and long-term outcomes such as increased school learning, improved performance and progression as well as improved health status and nutritional outcomes (Bastagli *et al*., 2016; Umezurike and Adam, 2020).

Moreover, Wright *et al*. (2018) and Sulaiman (2018) argue that to deliver well-performing public services the requirements for eligibility must be determined since targeting is the most required component. In addition, Bastagli *et al*. (2018) suggest that among other

factors connected with the achievement of conditional cash transfer in attaining its goals are the efficiency of targeting, the amount of transfer and the design and enforcement of the conditions. Targeting is one of the challenges in conditional cash transfers. To meet the intended goal of conditional cash transfer in Tanzania eligible beneficiaries are the ones that need to be included in the programme (URT, 2013).

The theory of change of cash transfer was considered applicable for this study as it describes the mechanism and paths in which conditional cash transfer programmes reduce poverty by improving immediate, intermediate and long-term outcomes by promoting human capital investments among poor households. Conditional cash transfers in Tanzania aim to enable needy households to raise their incomes, and opportunities and improve their food and non-food consumption (URT, 2013). The study by Evans *et al.* (2019) proved that cash transfers in Tanzania managed to increase the uptake of health insurance and increase under-five-year-old clinic attendance which reduces the number of sick days of the members of the household. In Tanzania, cash transfers contributed to households' having the ability to access food, health services and education (Mwaita, 2018). Moreover, a study by Mushi *et al*. (2019) shows that introduction of cash transfers in Tanzania improves poor household children's education in school attendance and increased enrollment as it enabled children's get all their requirements. Furthermore, the theory was relevant to this study because conditional cash transfers have been targeted as a strategy for poverty reduction. The study assumes that proper targeting of beneficiaries, level of transfer and proper payment systems will contribute to household food security and access to health services and education.

1.5 Conceptual Framework

The study's conceptual framework shows the relationship between the independent variables and the dependent variable. The independent variables include background

variables such as age, sex, education, marital status, household size, land size, household head's main occupation, the main source of income, farming, income-generating activities, institutional policy procedures such as payment system, selection process, the amount paid, involvement of local leaders, conditional cash transfer and cash transfer. The independent variable cash transfer has a direct influence on the dependent variable poverty reduction. The background variables are among the variables that are considered to affect a household's health, education and food security (Farzana *et al.*, 2017; Zhou, *et al.*, 2019). The cash transfer when predictably transferred directly to targeted poor households is expected to improve human capital and reduce poverty through households' food security, school attendance and access to health services.

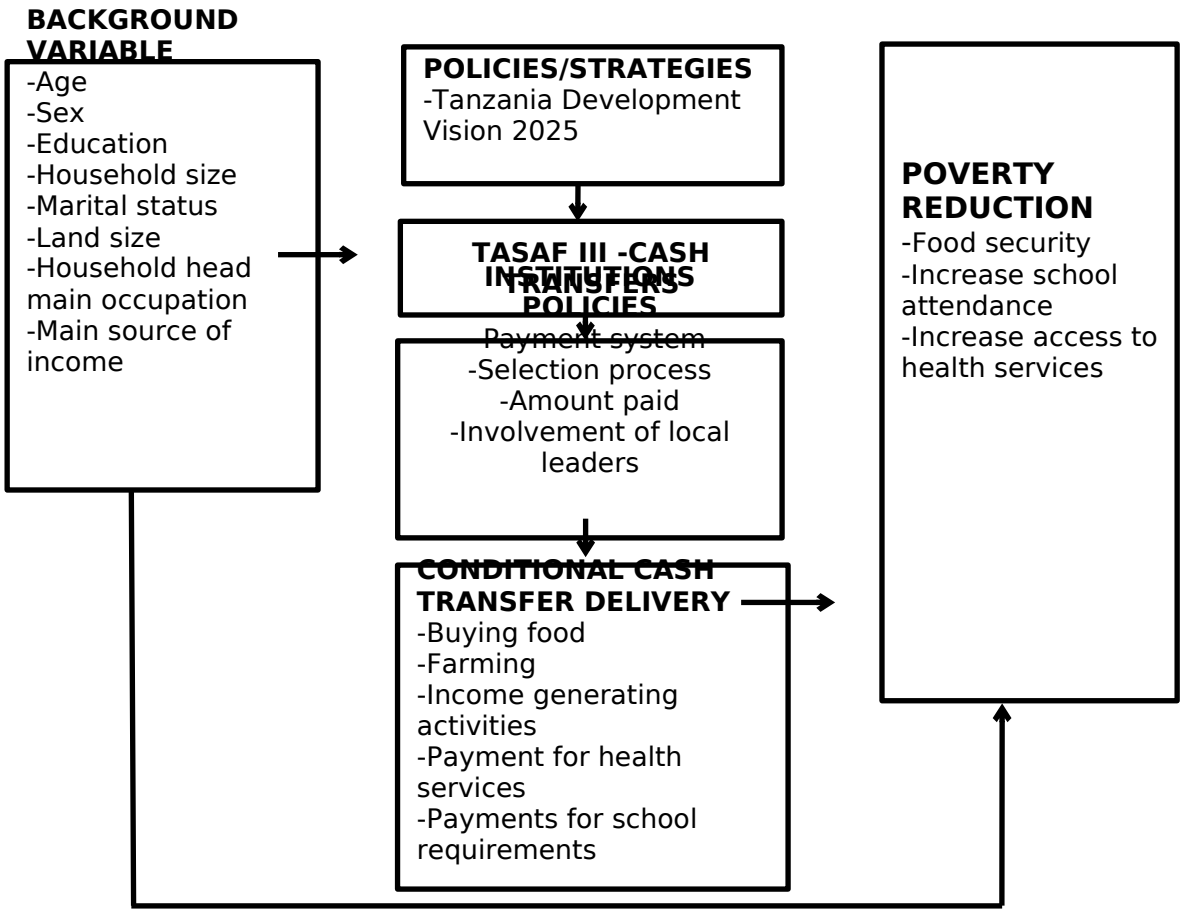

Figure 1.1: The conceptual framework showing contribution of cash transfers to poverty reduction

1.6 Organization of the Dissertation

The dissertation is organized into four chapters. The first chapter consists of an introduction to the overall study. The second chapter consists of a published paper that covers objective one and provides answers to research question one. The third chapter covers objective two and provides the answers to research question number two. The fourth chapter presents the study's conclusions and recommendations.

1.7 Limitations of the Study

The study was conducted during the planting season, so it was difficult to meet with the respondents on time. To overcome the situation the researcher used to meet them at their farms or on other people's farms where they work as labourers. Another plan was to meet them after working hours. Some were met on Sunday the day that most of them were not performing farm activities.

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CHAPTER TWO

PAPER ONE

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IMPACT OF CONDITIONAL CASH TRANSFER ON HOUSEHOLD FOOD SECURITY IN SUMBAWANGA MUNICIPALITY, TANZANIA

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1.1 Abstract

In Tanzania, poor households are served with Conditional Cash Transfers (CCT) to increase their incomes and opportunities while improving their food and non-food consumption. The study aimed at assessing the impact of conditional cash transfer on poverty reduction on household food security in the Sumbawanga Municipality, Tanzania. The study adopted a cross-sectional research design. This study used quantitative data generated from the household survey with a sample of 450 households. Data were analyzed by using propensity score matching with the aid of STATA 14. The study findings show that on average conditional cash transfer programmes have a significant effect on improving a household's food security by increasing food consumption by 47 percent and reducing adverse coping strategies by 59 percent. Cash given used to purchase food and reduce adverse coping strategies that make households have food

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security and reduced vulnerability. The study recommends that the Ministry under the President's Office Public Services Management and Good Governance through the conditional cash transfer programme to increase the amount of cash given to poor households and the Government, Non-Government Organizations (NGOs) and other stakeholders should work together with the conditional cash transfer programmes to continue to improve food security. Moreover, the programme is recommended to increase beneficiaries to help more households to graduate from extreme poverty.

Keywords: Conditional cash transfer, Poverty, Food security, Propensity score matching

1.2 Introduction

Food security is the state or condition whereby all people are physically, socially and economically well off all the time and have sufficient preferable, nutritious and safe food for a healthy life (FAO, 2012; Fraanje and Lee-Gammage, 2018). It is based on all four components of food security. The first component is food availability which means the physical supply of safe and nutritious food at a given time and place, which is generally concerned with food production at the national and local levels (Burchi and De Muro, 2016). The second component is food access which means the ability to acquire food or purchase food (Burchi, *et al.,* 2018). It is based on economic aspects whereby people and households can obtain food from the market or production and the major instrument used in this component of food security among others is income. The third component is food utilization which is the ability to change or transform food into the needed nutritious food. In totality, it is based on dietary choices which include high quality and varied diets with hygienic and health practices (Burchi *et al.,* 2018). The fourth component is food stability which is concerned with food stability throughout the year (Fraanje

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and Lee-Gammage, 2018). From the definition of food security households are viewed as food secure if their members have access to sufficient, safe and nutritious food at a given time and place. For the household to be food insecure is when its members do not get sufficient, safe and nutritious food in a given time and place.

Food insecurity is among the problems that face many poor households in developing countries like Tanzania. That is why there are attempts to initiate programme that will resolve the problem. This is also noted by FAO (2012) that 870 million people who were estimated to be 12.5 percent of the world population were undernourished and about 852 million people (98%) were from developing countries. Among others, the inability of poor households to purchase food while it is available at their markets is the main cause of food insecurity (FAO, 2012). The introduction of cash transfers was one of the solutions to resolving food insecurity among poor households in many developing countries. Cash transfers are used as social assistance to poor households to increase their access to goods and services like food, health and education (Owuso-Addo *et al*., 2018; Afzal *et al*., 2019). There are two forms: non-conditional and conditional cash transfer. Non-conditional cash transfer is cash directed to targeted poor households without any conditions and aimed at assisting them with their basic needs, while conditional cash transfer is cash directed to poor households with the condition of spending on food, health services and education of their children (Parker and Todd, 2017).

Conditional cash transfer in Tanzania is the programme that is objectively used to reduce poverty at the household level and is implemented by the government social fund agency known as the Tanzania Social Action Fund phase III (TASAF III) (URT, 2013). The programme aimed at poverty reduction also focused on improving basic services such as poor households' food

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security. From the perspective of this study, poverty reduction was considered to improve poor households' food security.

To reduce poverty the government of Tanzania with aid from the World Bank established the Tanzania Social Action Fund (TASAF) in 1999 as a basic mechanism for poverty alleviation. TASAF aims to support poor households and communities to improve their living standards by accessing services such as health, education, food, clean and safe water and being involved in other income-generating activities. Targeted poor households were assisted in graduating from poverty by having sustainable social and economic development. TASAF has been implemented in three consecutive phases (TASAF I, TASAF II and TASAF III).

TASAF I was implemented between 2000 and 2005 in 40 districts of Tanzania Mainland and Zanzibar and was based on infrastructure development such as the construction of simple bridges, schools, health centers and roads (URT, 2005). The aim was to improve social and economic service delivery in health, education, food security and water to poor communities. Furthermore, TASAF II was implemented in all District Councils, Municipalities and Town councils in the country from 2005 to 2009 and it was based on resolving the lack of social services, income poverty in rural and urban areas and enhancement of beneficiaries and institutions supporting targeted communities and households (URT, 2005). However, the government noted that both TASAF I and II did not do enough in alleviating poverty because the programmes did not provide adequate coverage as they concentrated only on community social development instead of the individual poor people's livelihood. The incapability of TASAF I and TASAF II led to some households being left in extreme poverty. This prompted the government to come up with TASAF III.

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The TASAF III was introduced in Tanzania in 2012 to reduce and break the intergenerational transmission of poverty and is based on integrated interventions: productive social safety net, enhancement of livelihoods and increasing income, targeted infrastructure development and capacity building (URT, 2013). The productive social safety net integrates conditional cash transfers and public work programmes. The transfers intend to safeguard poor households from the severe consequences of poverty by assisting them with their food security (URT, 2013). The main objective of the programme was to enable poor households to increase their incomes and opportunities while improving their food and non-food consumption through CCT (URT, 2013). Through conditional cash transfers, it is expected that poor households will have the ability to access sufficient, nutritious and safe food at a given time and place. Furthermore, there is clear evidence that conditional cash transfers used half of it intended for food, one-third for household expenses and the remainder for health, education or other investments (Mohammdi, 2019). Furthermore, it is argued that the use of conditional cash transfers on poor households improves food security in the long term as it invests in young children's nutrition which in the future will help to have stronger, smarter and healthier adults (Brenyah and Domfe, 2019). The government of Tanzania is committed to supporting households to graduate out of both food and basic-needs poverty.

Apart from the CCT programme implemented to reduce poverty in Tanzania poverty is still relatively high. The proportion of people living below the national basic needs poverty line of TZS 49 320 per adult per month was 26.4 percent as per the 2017/2018 Household Budget Survey (HBS) (URT, 2019). Moreover, the occurrence of poverty was higher in rural areas (31.3%) than in urban areas (15.8%) while it was highest in the Rukwa Region (45.0%) and lowest in Dar es Salaam Region (8.0%) (URT, 2019). Furthermore, URT (2019) shows that 8 percent of Tanzania's population falls below the food poverty line (extremely poor). At the

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regional level, the Rukwa Region has the highest food poverty of 19.8 percent (URT, 2019a). In addition, at the regional level, the Rukwa Region has the highest poverty gap of 12.9 percent and the severity of poverty of 4.8 percent, while at the national level, the poverty gap is 6 percent and the severity of poverty was 2 percent (URT, 2019).

Despite all the efforts of the government to reduce poverty in the country, Rukwa Region remains the poorest region with a 45 percent poverty level and the food poverty level of 19.8 percent. Although there are some studies noted in Tanzania conditional cash transfers improve poor households' food security (Jacobus, 2020; Mzingula, 2020). However, there is scant information about the impact of the CCT programme in the Sumbawanga Municipality which is in the region with the highest poverty level of 45 percent and the food poverty level of 19.8 percent while CCT has been in operation since 2015. This study intends to assess the impact of conditional cash transfers on poor households' food security in the Sumbawanga Municipality, Tanzania.

1.3 Research Methodology

1.4 Study area Description

The study was conducted in Sumbawanga District in Sumbawanga Municipal Council, Rukwa. The Sumbawanga District is one of the three districts of the Rukwa Region. It is located at 7° 58' 0" South, 31° 37' 0" East in Tanzania's South-West highlands (URT, 2016). The District borders Zambia in the South, the Songwe Region in the South-east, Lake Tanganyika in the South-West and the Nkasi District to the North (URT, 2016). The Sumbawanga Municipal Council is located in the Western part of Tanzania and is the administrative center of the Rukwa Region. The Council has a dry sub-humid climate and is located at an average altitude of 1700 m above sea level. It has an average rainfall of 900 mm-1000 mm per year with an average annual

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temperature of 27 ^{0}C (SMC, 2018). The main economic activities of people from the Council are agriculture, business and waged work from the Government and non-government organizations. Various crops such as maize, beans, wheat, sunflower, groundnuts, potatoes, sugarcane and horticultural crops are produced in the area and are involved in livestock keeping like cattle, goats, pigs, sheep and poultry (SMC, 2018). The Council was selected because it is among the councils in which CCT is operated. Moreover, is among the Councils within the region with the highest basic needs poverty of 45 percent and the food poverty level of 19.8 percent relative to Tanzania's average level of basic needs poverty of 31.3 percent and food poverty of 8 percent.

1.5 Research Design

The study employed a cross-sectional research design. The design allowed the collection of similar data from respondents in different areas and data collected at one point in time (Setia, 2016). The purpose of using a cross-sectional design was to obtain consistent data that makes robust conclusions and creates new assumptions that can be examined with new research (Zangirolami-Raimundo *et al.,* 2018). Moreover, a cross-sectional research design is most useful for descriptive purposes and for determining the association among variables at a specific point in time (Setia, 2016). In addition, the study used a quantitative research approach as the method was appropriate to answer the research question.

1.6 Sampling Design and Data Collection

The study used multi-stage sampling to achieve the appropriate sample from the study population. The first step involved the purposive selection of the Sumbawanga District, then the second step was the selection of Itwelele and Lwiche divisions, the third step was Milanzi and Katandala Wards and the last step was the selection of Milanzi and Katandala Streets. Purposive sampling is used to focus on specific features of the population that facilitate the answering of

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the research questions (Etikan *et al*., 2016). The wards have been selected due to the availability of beneficiaries in the area, Katandala Ward has 193 and Milanzi Ward has 459 (SMC, 2019). Multistage sampling was used due to its flexibility as it was simple to break down the population to the appropriate sample population (Sabo and Lekan, 2019). Simple random sampling was conducted to select the sample of 450 households for research. The sampling was conducted by having the list of respondents in the selected area then followed by assigning numbers in the chits of paper and being put into a box that was properly mixed manually. Then, chits were randomly picked out of the box to select the sample. The method ensures that the outcomes attained from the sample were likely to be those that would have been attained if the whole population had been measured (West, 2016). Quantitative data used in the study were obtained from a household surveys where a structured questionnaire was administered to the respondents in the study area. Quantitative analysis was adopted to address the research objective.

1.7 Sample Size

Effective reduction of bias in propensity score matching is achieved when the sample size is higher with a minimum of 200 samples (Howarter *et al.,* 2015), thus from that justification, the study used 450 samples of which 171 were the treated group and 279 were the control group. The main condition in the propensity score matching is the balancing covariates (characteristics of participants) between the treated group and the control group (Howarter *et al*., 2015; Benedetto *et al*., 2018). The sample was selected to comply with the condition of balancing covariates. Treated groups or beneficiaries are households that receive cash from the programme (URT, 2013). The control group or non-beneficiaries are the ones without cash transfers.

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1.8 Data Processing and Analysis

Descriptive and inferential statistics were utilized in the analysis of data using STATA 14, descriptive statistics tools include mean and percentage while the inferential statistics logit regression model was used. To evaluate the intervention's impact the study used propensity score matching. Propensity score matching is the non-experimental method used to estimate the causal effect of the programme when participation in the programme is non-random (Forbes and Dahabreh, 2020). The method was useful for this objective as it was used to evaluate how cash transfer has an impact on household food security during the identification of beneficiaries randomization was not involved instead conditionals were applied (URT, 2013). The programme identified poor households by using pre-determined criteria such as households that are below the poverty line, households with a large number of dependents and those that are unable to fulfill their basic needs, households that are unable to eat three meals, households with school-going children but those who are not enrolled in school due to lack of income to acquire school requirements and households with under five-year-old children who do not attend clinics due to lack of funds for health services (URT, 2014).

The method was effective in reducing biases caused by confounding variables by estimating the effect of intervention by considering covariates of the treated group and control group (Rosenboum and Rubin, 1983; Benedetto *et al*., 2018; Johnson *et al*., 2018). The beneficiaries' households were compared and matched with non-beneficiary households in all similar observable social-economic characteristics except the treatment (Schulte and Mascha, 2018; Forbes and Dahabreh, 2020). The propensity score matching had two assumptions; the first is the unconfoundedness or conditional independent assumption, which needs all variables that influence treatment assignment and potential outcomes to be observed by the researcher and the second is common support or overlap, which explains why people with the same observable

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covariates have a positive probability of being assigned to treatment or not (Lin, 2015; Morgan, 2018).

The study used six steps in propensity score matching. The first step was covariates identification. Covariates are characteristics of the participants in the study except for the treatment and are used to serve as the predictor of involvement in the programme (Harris and Horst, 2016). Covariates used were the age of household head, education of the head of household, household size, marital status of head of household, household's gender, land ownership, main occupation and main source of income. The second step was the propensity score estimation. The propensity score is used as a device to balance the observed distribution of covariates between the treated (CCT beneficiaries) and the comparison group (non-beneficiaries) (Hotmaida and Purba, 2018).

$$e(x) = pr(Z = 1|x) \quad \ldots\ldots (1)$$

Where e(x) = was the propensity score, Z was the binary dependent variable for being beneficiary (Z=1 if CCT beneficiary, and Z=0 non-beneficiary) and X were observable covariates that may influence to be CCT beneficiary. When calculating the impact of a CCT intervention propensity score e(x) generates appropriate matches if and only if all relevant information about programme participation and outcomes of interest is available (Onyango, 2017). The propensity score was estimated by the logit regression model as follows:

$$e(x) = Z = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \cdots \beta_n X_n + \varepsilon_i \quad \ldots\ldots (2)$$

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e(x) = Propensity score, Z = Treatment (1 = received cash, 0 = otherwise), β_o = Intercept of regression equation, β_1-β_n = Estimated regression coefficient, X_1-X_n = Observed covariates and ε_i = Error term.

The next step was the balancing procedure conducted to estimate the common support. Each propensity score of the treated group was matched with one control group (Hotmaida and Purba, 2018). Common support is the section that represents the similarity of characteristics between the two groups based on their similarities in the distribution of their propensity scores (Hotmaida and Purba, 2018). The aim of matching households that receive conditional cash transfers with households that have the same observable covariates but do not receive the conditional cash transfers was to avoid comparing incomparable groups.

The fourth step was to select the matching algorithm that was used to ensure the consistency and efficiency of the matching (Harris and Host, 2016). According to Lin (2015), there are several matching algorithms used such as the Nearest Neighbour Matching algorithm (NNM), Kernel Matching (KM), Radius or Caliper Matching (CM), Stratification Matching (SM) and Mahalanobis Metric Matching (MMM). The study used the nearest neighbour matching algorithm, radius matching and kernel matching as the algorithm ensures quality matching between treated and control groups (Lin, 2015; Harris and Host, 2016).

1.8.1 Estimating the Average Treatment on Treated (ATT)

The fifth step was to estimate the effect of the conditional cash transfer on the food security of beneficiaries. Let T_{1i} = 1 represent the CCT beneficiaries, T_{0i} represent the non-beneficiaries, Y_{1i} represent the potential outcome of beneficiaries and Y_{0i} represents the potential outcome of non-beneficiaries. Treatment effect Z was calculated as follows:

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$$Z = Y_{1i}(T_{1i} = 1) - Y_{0i}(T_{0i} = 1) \quad \text{.....(3)}$$

Evaluating the impact of treatment in observational studies needs counterfactuals as the outcomes of beneficiaries and non-beneficiaries cannot be observed at the same time. Therefore, the estimate of ATT was calculated as follows:

$$ATT = E(Y_{1i}/T = 1) - E(Y_{0i}/T = 0) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (4)$$

ATT was the average treatment of the treated group, $E(Y_{1i}/T = 1)$ was the outcome of the treated group or beneficiary and $E(Y_{0i}/T = 0)$ was the outcome of the control group or non-beneficiary.

This study evaluates the impact of CCT on food security among household beneficiaries. Food security was measured by the Coping Strategic Index (CSI) and the Food Consumption Score (FCS). The food consumption score was calculated by multiplying the frequency of foods consumed in the last seven days with the weight of each food group (WFP, 2008). Moreover, it was measured by comparing the pre-established thresholds which are 0-21 for poor food consumption, 21.5-35 for borderline food consumption and above 35 for acceptable food consumption.

On the other hand, food security was measured by the coping strategic index which was calculated by multiplying the frequency of coping strategies by their respective severity weights (Drysadale *et al.,* 2019). The frequency of coping strategies was measured by determining how many days in the last seven days the households had relied on particular coping strategies.

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According to Drysadale *et al.* (2019), the pre-established thresholds for CSI were 0 for food security, 1-30 for low food insecurity, 31-60 for moderate food insecurity, 61-90 for high food insecurity and 91-120 for severe food insecurity. The ideal model for analysis was the logit regression model.

$$\ln\left(\frac{\hat{p}}{1-\hat{p}}\right) = Y = \beta_0 + \beta_1 Z + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \varepsilon_i \quad ..(5)$$

ln = Natural Logarithm, $\hat{p}$ = Probability of being food secured, $\frac{\hat{p}}{1-\hat{p}}$ = Probability of being food insecure, Y= Food security (1 food secured, 0 not food secured), Z = Treatment (1 = received cash, 0 = otherwise), β_o = Intercept of regression equation, β_1- β_8 = Estimated regression coefficient, X_2 = Age, X_3 = Sex, X_4 = Marital status, X_5 = education level, X_6 = Household size, X_7 = Main source of income, X_8 = land size, X_9 = Main occupation and ε = Error term. The description of variables used presented in Table 1.1.

Table 1.1: Description of variables used in the equation

Variable	Variable	Nature	Variable Description
Dependent variables			
	Food security	Binary	Food secured or not food secured.
Independent variables			
	Age	Continuous	The number of years of household head since born.
	Sex	Dummy	Sex of household head.
	Marital status	Categorical	Marital status of the head of household.
	Education level	Categorical	The time that the head of household spent on formal education.
	Household size	Continuous	The number of members in the household.
	The main source of income	Categorical	The main source of income of the head of household.
	Land size	Continuous	Size of land owned by the head of household.

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	Main occupation	Categorical	The main occupation of the head of household.

Source: Authors' conception based on theoretical and empirical review

1.8.2 Sensitivity analysis

The Rosenbaum bounds sensitivity analysis was performed to check for the presence of hidden bias caused by unobserved covariates between the treated and control groups. The hidden biases due to unobserved covariates in the study can lead to incorrect effects evaluations (Rudolph and Stuart, 2018).

1.9 Results and Discussion

This section covers summary statistics on socio-economic characteristics of respondents, empirical estimation, interpretations and discussion.

1.9.1 Socio-Economic Characteristics of Respondents

Table 2.2 depicts in summary, the percentage of sampled households used in the study based on their socio-economic characteristics. The respondents of the study were dominated by female-headed households rather than male-headed households because female-headed households were more considered than male-headed households (URT, 2014).

Table 1.2: Socio-Economic Characteristics of Respondents

Variable	Description variable	CCT beneficiary (%)	Non-CCT beneficiary (%)	Total households (%)
Sex	Female	83	79	80
	Male	17	21	20
Marital status	Married	46	56	52
	Single	4	3	3
	Divorced	9	8	8
	Cohabiting	1	3	2
	Widow	40	30	34

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Number of meals	1	0	2	1
	2	64	88	79
	3	36	10	20
Main occupation	Farming	50	47	48
	Livestock keeping			
	Small business	6	7	6
		44	46	46
Education level	Informal	47	42	44
	Primary	52	57	55
	Secondary	1	1	1

Total households (n=450)

Table 1.2 represents that female-headed households contributed 80 percent of the sampled households and male-headed households contributed 20 percent. According to URT (2019), poverty was associated with the sex of the household head. Female-headed households have 27.4 percent of basic needs poverty and 7.9 percent of food poverty while male-headed households have 26 percent of basic needs poverty and 8.1 percent of food poverty. In addition, female-headed households were most trusted by TASAF as women were close to their children, making sure that they get food, attend school and visit health centers for checkups and vaccinations. Furthermore, the study's respondents worked in a variety of occupations, with 48 percent being farmers and 46 percent working in small businesses. The majority were farmers and farming was the main source of income of many households in the study area. In Tanzania's population, the majority relies on farming as the main source of income but unfortunately remains poor (Kinuthia and Mabaya, 2017). Moreover, most poor households were still struggling to have three meals per day as only 36 percent of beneficiaries were taking three meals per day. The education level of the head of household in the study ranged from informal to primary, whereby 55 percent had a primary level of education and 44 percent had informal education. The majority had a low level of education which narrows the opportunities in labour

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markets and hence influences poverty conditions within the household. As argued by Mok and Jiang (2017), education is the determinant of personal income and a higher level of education creates a greater chance in the labour market.

Table 1.3: Household Size, Age of Household Head and Land Size

Variable	Sampled households N=450			CCT beneficiary N=171			Non-CCT beneficiary N=279		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Member of household	6	1	12	5	1	12	6	2	12
Age (years)	54	20	98	56	20	98	52	20	98
Land size (acres)	0.87	0	4	0.89	0	4	0.84	0	4

Table 1.3 shows that the average household size was 6 members although the highest was 12. According to URT (2019), poverty increases with an increasing number of household members. In a household with 6 members, 10.2 percent of the members experience food poverty and 28.5 percent of the members experience basic needs poverty. The programme provides the identified poor households with a basic cash transfer of $5 or TZS 20 000 (URT, 2013). Because the programme did not take the number of household members into account it was assumed that the larger the number of household members the smaller the impact of cash given. Poor households with fewer members benefited from basic cash transfers compared to ones with more members. On the other hand, on average sampled household heads were 54 years old. In developing countries, poverty increases with the increase of age (Vera-Toscano *et al.,* 2020). As it is shown that beneficiaries are older than non-beneficiaries this implies that poverty increases with age in the study area. Moreover, most of households in the study area have land size of less than one acre.

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1.9.2 Propensity Score estimation

The propensity score was used as a device to balance the observed distribution of covariates between CCT beneficiary households and non-beneficiary households. The balancing test was conducted and the common support option was selected and the region was (.23592335, .71140465). The propensity scores were strictly between 0 and 1and there was sufficient overlap in the propensity scores between treated and control groups with a large common support region. This explains that common support was satisfactory and the balance was achieved between the treated and control groups. Figure 1.1 below shows the distribution of propensity scores across the treated and control groups.

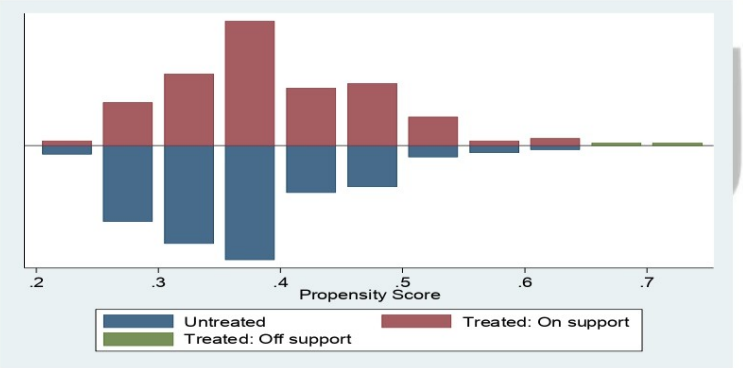

Figure 1.1: Description of the estimated propensity score in the common support region

1.9.3 Balancing of socio-economic characteristics of CCT beneficiaries and non-beneficiaries

Table 1.4 below shows the balance of conditional cash transfer beneficiaries and non-beneficiaries to meet the condition of comparing matched groups to reduce selection bias. The balancing was conducted by the use of a two-sample t-test.

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Table 1.4: Balancing of socio-economic characteristics of CCT beneficiaries and non-beneficiaries

	CCT beneficiary 171	Non-CCT beneficiary 279	
Variable	**Mean/Proportional**	**Mean/Proportional**	**P- Value**
Age	56.116	52.279	0.008
Sex	1.830	1.788	0.278
Marital Status	2.847	2.512	0.060
Education level	2.432	2.261	0.235
Household size	5.596	5.716	0.524
Main occupation	1.935	1.992	0.544
Main income	1.198	1.100	0.045
Land size	0.894	0.849	0.655

Table 1.4 shows the mean of the covariates where the condition was satisfied at a p-value 0.05. It is indicated that 75 percent of social-economic characteristics were insignificant at a p-value 0.05 which implies that there is no statistical difference between the treated (beneficiary) and control group (non-beneficiary). This implies that comparisons are made on comparable groups, which reduces bias.

1.9.4 Impact of conditional cash transfer on poor household food security

1.9.4.1 Household food security by using coping strategic index

Table 1.5 presents estimates of the impact of conditional cash transfer on food security based on the use of a coping strategic index. Having a negative sign in the coping strategic index means there was minimal use of coping strategies in mitigating food shortage at the household level thus meaning the households were food secure. The overall results from the matching algorithms used are quite close to each other and show that on average the programme has a positive effect on the households' coping strategies which range from 56 percent - to 60 percent. In the nearest neighbour matching the findings show that the programme reduces coping strategies by 56 percent at $p< 0.01$ and the effect was highly significant at a 1 percent level of significance. On the other hand, in radius and kernel matching the programme reduced the coping strategies by 60

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percent at p< 0.01 and the effect was highly significant at a 1 percent level of significance. On average, the programme improves food security by reducing adverse coping strategies by 59 percent.

Table 1.5: Impact of conditional cash transfer on household food security by using coping strategic index

Outcome variable	Model Specification					
	Nearest neighbour		Radius Matching		Kernel Matching	
	ATT	P	ATT	P	ATT	P
Food security CSI	-0.556	0.001***	-0.601	0.0005***	-0.602	0.0005***
Observations						
CCT beneficiary		171		171		171
Non CCT beneficiary		279		275		275

*** p< 0.01, ** p< 0.05, * p< 0.1

From Table 1.5 it was concluded that the conditional cash transfer has a positive impact on households' food security as on average it reduces the household's severity of coping strategies by 59 percent. Before the CCT programme households were using many adverse coping strategies such as depending on less preferred and less expensive foods, purchasing food on credit, limiting portion size at mealtimes, reducing the number of meals eaten in a day, restricting consumption by adults for children to eat, selling off assets and borrowing food, or relying on help from a friend or relative. Participation or being a beneficiary of the conditional cash transfer programme improves their food security by reducing the use of adverse coping strategies. This implies that cash given is used to purchase food so poor households reduce the use of adverse coping strategies since their households were food secured for a longer time and reducing their vulnerability. The results are linked with the studies of (Onyango, 2017; Kileo, 2019; Mzingula, 2020) who also found that conditional cash transfer improves beneficiary households' food security by decreasing the adverse coping strategies used by households.

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1.9.4.2 Food security by using food consumption score

Table 1.6 shows food security by using food consumption score in nearest neighbour matching on average the programme improved food security by 43 percent at p< 0.01 and the result was highly significant at a 1 percent level of significance while in radius and kernel matching food security improved by 49 percent and 48 percent at p< 0.01 respectively. On average the programme improves a household's food security by increasing food consumption by an average of 47 percent.

Table 1. 6: Impact of conditional cash transfers on food security by using food consumption score

Outcome variable	Model Specification					
	Nearest neighbour		Radius Matching		Kernel Matching	
	ATT	P	ATT	P	ATT	P
Food security FCS	0.426	0.0005***	0.486	0.001***	0.484	0.0005***
Observations						
CCT beneficiary		171		148		171
Non CCT beneficiary		279		279		275

*** p<0.01, ** p< 0.05, * p< 0.1

From Table 1.6 the household's food consumption was improved in beneficiaries which implies that there was an improvement in the household's dietary diversity and nutrient intake. In another way, having nutritious food improves household health status. The results were correlated with the studies of (Haushofer and Shapiro, 2016; Bhalla *et al*., 2017; Kapama, 2017; Kileo, 2019; Kronebusch and Damon, 2019; Resosudarmo *et al*., 2020) who concluded that conditional cash transfer improves food security in beneficiary households as the cash provided helps them to buy food for their households. Cash transfers provide the chance for households to purchase food at the market and therefore increase the consumption of a variety of foods which directly increases the nutritional value of the households. The cash provided offers a free option to buy different types of food according to the needs of the members of the household.

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Furthermore, cash provided used by beneficiaries to finance agricultural activities or in other income-generating activities that generally increase the household income which consequently increases the chance of accessing food (Raghunathan *et al.,* 2017; Burch *et al*., 2018; Mohammdi, 2019; García-guerra *et al*., 2019; Palmeira *et al*., 2019; Mzingula, 2020).

1.9.5 Sensitivity analysis of food security

The Rosenbaum bounds sensitivity analysis was performed to check for the presence of hidden bias caused by unobserved covariates between the treated and control groups.

Table 1.7: **Rosenbaum sensitivity analysis for average treatment effect on treated**

Rosenbaum bounds for coping strategic index (N= 450 matched pairs)			**Rosenbaum bounds for food consumption score (N= 450 matched pairs)**		
Gamma	**Sig+**	**Sig-**	**Gamma**	**Sig+**	**Sig-**
1	0	0	1	0	0
2	0	0	2	0	0
3	3.3e-15	0	3	0	0
4	7.6e-12	0	4	0	0
5	8.0e-10	0	5	0	0
6	1.8e-08	0	6	2.0e-15	0
7	1.7e-07	0	7	1.7e-13	0
8	9.2e-06	0	8	5.1e-12	0
9	3.4e-06	0	9	7.0e-11	0
10	9.9e-06	0	10	5.8e-10	0

***Gamma-log odds of differential assignment due to unobserved factors; Sig+ - upper bound significance level; Sig- - lower bound significance level**

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Table 1.7 shows that p-critical values of all outcome variables estimated at various levels of critical gamma values are significant at $p<0.05$, indicating that the main covariates influencing conditional cash transfer participation and the outcome variables have been considered, and changes in gamma values did not change the study conclusions. Therefore, the positive effect of conditional cash transfer on household food security was not influenced by hidden bias due to unobserved covariates.

1.10 Conclusion and Recommendations

1.10.1 Conclusion

The main objective of this study was to assess the impact of conditional cash transfers on household food security. Based on the findings the study observed that the conditional cash transfer programme in the Sumbawanga Municipality has a positive impact on reducing poverty, especially on food security as the programme reduces the use of adverse coping strategies and at the same time the cash used to improve households' food consumption. This implies that a conditional cash transfer programme improves household food security by increasing food consumption while reducing adverse coping strategies. To be a beneficiary was more advantageous than non-beneficiary as many of them in the study area experience food poverty. Through the programme, poverty was reduced as the cash given to beneficiaries assists them to meet their food consumption while preventing them from falling into extreme poverty and improving their livelihood in the long term.

1.10.2 Recommendations

Therefore, based on the study findings and conclusion, it is recommended that:

i. The Ministry under the President's Office Public Services Management and Good Governance and Non-Government Organizations (NGOs) should continue to support

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CCT programmes to increase the amount of cash given to poor households. Increasing the amount of money given by CCT programme can support their daily life needs and invest in income-generating activities.

ii. The Government, Non-Government Organizations and other stakeholders have to work together to ensure food prices remain stable and incentives are given to key players to ensure long-term food access.

iii. TASAF has to increase the number of beneficiaries to help more households graduate from food poverty in the study area.

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CHAPTER THREE

MANUSCRIPT ONE

3.0 IMPACT OF CONDITIONAL CASH TRANSFER ON HUMAN CAPITAL INVESTMENT IN SUMBAWANGA MUNICIPALITY, TANZANIA

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3.1 Abstract

Conditional Cash Transfers (CCT) assist poor households to improve human capital investments, especially in access to health services and education for their children. The study aimed to evaluate the impact of conditional cash transfers on education and health in the Sumbawanga Municipality, Tanzania. The study adopted a cross-sectional research design. This study used quantitative data generated from the household survey with a sample of 450 poor households. Data were analyzed by using propensity score matching with the aid of STATA 14. The study findings show that on average conditional cash transfer programmes improve human capital investment by increasing access to health services by 70 percent and increasing school attendance by 32 days. Cash given was used to pay for medical care and buy school requirements for their children hence improving school attendance and the health status of members of the household. The study recommends that the Ministry under the President's office Public Services Management and Good

Governance through the CCT programme increase the amount of basic cash given to poor households with higher household size, and the Government, Non-Government Organizations and other stakeholders should work together with the CCT programme to continue to improve education and access to health services in the study area.

Keywords: Conditional cash transfer, Poverty, Human capital investment, Propensity score matching

3.2 Introduction

A cash transfer is social support given to poor households intentionally to increase their access to services like health services and education (Owuso-Addo *et al*., 2018; Afzal *et al*., 2019). Non-conditional and conditional cash transfers are two forms of cash transfers. Non-conditional cash transfer is cash given to poor households without any conditions and is aimed at assisting them with their basic needs (URT, 2016). Conditional cash transfer is an intervention that assists in the form of cash to poor households with the condition of spending on health services and education of their children to improve human capital investments (Cahyadi *et al*., 2021; Onwuchekwa *et al*., 2021). Human capital investments through education and medical care are planned to increase performance and productivity in different activities (Nandi *et al*., 2018).

Cash transfers are used as social protection with the main objective of reducing poverty and for years now many developing countries have used cash transfers as an approach to reduce poverty. As per Daidone *et al.* (2019), in countries with many poor households effective design and application of cash transfer programmes can promote poverty reduction. In Tanzania poor households stay behind in terms of income, food quality and quantity, educational attainment and their use of health services (URT, 2019). For that reason, poverty reduction programmes are important to alleviate the effects of poverty at the

household level. However, it is still questionable whether such programmes have an impact on human capital investment at the household level.

The UN (2019) defines poverty reduction as procedures that assist poor people in achieving adequate living standards and exercising their human rights. It includes the redistribution of opportunities, assets and incomes with the provision of social protection to poor households for economic development (Pelizzo and Kinyondo, 2018). In the interest of this study, poverty reduction was considered in human capital investments specifically in improving access to health services and education. A cash transfer has a positive impact on reducing poverty in a way that improves human capital through education and the health of poor households. Cash transfers in Tanzania reduce poverty by improving beneficiaries' health status and education outcomes by increasing children's school enrollment and attendance (Jacobus, 2020). Evans *et al.* (2019) proved that cash transfer in Tanzania managed to increase the uptake of health insurance and increase less than five-year-old clinic attendance which reduces the number of sick days of the members of the households.

Moreover, Dietrich *et al*. (2020) noted that other cash transfer helps to increase the child's health as they get immunized at a required time. Furthermore, Mwaita (2018) found that cash transfers contributed to households' ability to access food, health services and education. CCT improves the educational outcomes of poor households at different levels in society. According to Molina Millán *et al*. (2019), the study from Honduras noted that CCT has a long-term impact on human capital as it increases the beneficiary children's school enrollment in a secondary school which also gives them a great chance to attend universities. In addition, Sanchez Chico *et al*. (2020) argued that CCT in El Salvador helps improve schooling outcomes as it increases school enrollment and attendance.

The Government of Tanzania established the Tanzania Social Action Fund (TASAF) in 1999 as a basic mechanism for poverty alleviation. TASAF aimed to support poor households and communities to improve their living standards by accessing services such as health, education, food, clean and safe water and being involved in other income-generating activities. TASAF has been implemented in three consecutive phases (TASAF I, TASAF II and TASAF III). The Government noted that both TASAF I and II did not do enough in alleviating poverty because the programmes did not provide adequate coverage as they concentrated only on community social development instead of the individual poor people's livelihood. Due to the incapability of TASAF I and TASAF II, some households were left in extreme poverty with poor health and education services. From that situation, poor households' children lacked access to health services and education which resulted in poor school enrollment, school attendance and increased school dropouts (URT, 2013). This has driven the Government of Tanzania to come up with TASAF III introduced in Tanzania in 2012 to reduce and break the intergenerational transmission of poverty (URT, 2013). The TASAF III has conditional cash transfers which intend to safeguard poor households from the severe consequences of poverty by empowering households to invest in human capital investment for their children (URT, 2013).

Despite evidence from research studies (Evans *et al*., 2019; Jacobus, 2020), Tanzania continues to score a high poverty rate, with 26.4 percent of people living below the national basic needs poverty line, with the Rukwa Region having the highest proportion (45.0%) (URT, 2019). Apart from the Tanzania government putting in place several strategies for poverty reduction as shown above the strategy has enabled the Government to achieve much success including increasing the coverage of education and health services. However, poor households continue to lag behind the rest of the population in terms of their educational attainment and their use of health services. Yet, despite all the efforts of the Government to

reduce poverty in the country, still there was scant information about the impact of the conditional cash transfer programme on human capital investment in Sumbawanga Municipality. This study calls attention to evaluating the impact of conditional cash transfers on poor households' health and education status in Sumbawanga Municipality, Tanzania.

3.3 Research Methodology

3.4 Study area Description

The study was conducted in Sumbawanga District in Sumbawanga Municipal Council, Rukwa. The Sumbawanga District is one of the three districts of the Rukwa Region. It is located at 7° 58' 0" South, 31° 37' 0" East in Tanzania's South-West highlands (URT, 2016). The District borders Zambia in the South, the Songwe Region in the South-East, Lake Tanganyika in the South-West and the Nkasi District to the North (URT, 2016). The Sumbawanga Municipal Council is located in the Western part of Tanzania and is the administrative centre of the Rukwa Region. The Council has a dry sub-humid climate and is located at an average altitude of 1 700 m above sea level. It has an average rainfall of 900 mm - 1 000 mm per year with an average annual temperature of 27 ^{0}C (SMC, 2018). The main economic activities of people from the Council are agriculture, business, and waged work from the Government and non-government organizations. The Council has 42 health facilities; 2 hospitals, 3 health centres and 37 dispensaries. In terms of education, the Municipality has 42 pre-primary schools, 58 primary schools, 25 secondary schools and 2 teachers' training colleges (SMC, 2018). The Council was selected because it was among the councils in which CCT operated and was in the region with the highest poverty level of 45%.

3.5 Research Design

The study adopted a cross-sectional research design; the design was considered as it allowed the collection of data at one point in time (Setia, 2016; Spector, 2019). Moreover, using a cross-sectional research design assists in obtaining consistent data that makes robust conclusions and creates new assumptions that can be examined with new research (Zangirolami-Raimundo *et al.*, 2018). In addition, the quantitative research approach was used as the approach assisted to answer the research question; since quantitative research is used to understand the relationship between the independent and dependent variables in a population (Bloomfield and Fisher, 2019).

3.6 Sampling Design and Data collection

The study used multi-stage sampling steps to obtain the needed sample population. The first step involved was the purposive selection of the Sumbawanga District; the second step was the selection of the Itwelele and Lwiche divisions; then followed by the selection of Milanzi and Katandala Wards and the last step was the selection of Milanzi and Katandala Streets. The wards have been selected due to the availability of many respondents in the area, Katandala Ward has 193 and Milanzi Ward has 459 (SMC, 2019). Simple random sampling was conducted to select the sample of 450 households for research. The method helps to obtain a good representative of the entire population and reduces bias. The sampling was conducted by having the list of respondents in the selected area then followed by assigning numbers in the pieces of paper and being put into a box that was properly mixed manually. Then, pieces were randomly picked out of the box to select the sample. The household survey was used to obtain the quantitative data used in the study.

3.7 Sample Size

The study used 450 poor household samples of which 171 were the treated group (CCT beneficiaries) and 279 were the control group (Non-beneficiaries). The study sample was justified by the studies of (Howarter *et al.,* 2015 and Andrillon *et al*., 2020) that used propensity score matching with a minimum of 200 samples and come up with efficient estimates.

3.8 Data Processing and Analysis

The collected data was coded, verified, compiled and cleaned before the analysis using STATA 14. Descriptive and inferential statistics were utilized in the analysis, descriptive statistics tools were mean and percentage while the inferential statistics logit regression model was used. Moreover, propensity score matching was used to evaluate the impact of the programme on a household's health and education as the method used to assess the impact of the programme when participation in the programme was not randomized (Forbes and Dahabreh, 2020). The method was ideal for the objective because during poor households' identification, conditionals were involved instead of randomization procedures (URT, 2013). The propensity score matching method is used to reduce biases caused by confounding variables by assessing the effect of intervention while taking the socioeconomic characteristics of the treated and control groups into account (Benedetto *et al*., 2018; Johnson *et al*., 2018; Guo *et al*., 2020).

In performing propensity score matching, six steps were used. The first step was the identification of covariates. The household head's age, education, household size, marital status of the head of household, household gender, land size, main occupation, and main source of income were the covariates used. The next step was the estimation of the propensity score. The propensity score was the probability of taking treatment based on

observed socioeconomic characteristics (Harris and Horst, 2016; Yasunaga, 2020). Propensity scores in this study were conditional probabilities that can influence the household to be in the conditional cash transfer programme or not.

$$b(x) = pr(D=1|V) \quad \text{(1¿}$$

Where b(x) = propensity score, D = binary dependent variable for being beneficiary (D =1 if CCT beneficiary and D = 0 non-beneficiary), and V = observable covariates. The logit regression model was used to estimate the propensity score:

$$b(x) = D = \beta_0 + \beta_1 V_1 + \beta_2 V_2 + \beta_3 V_3 + \ldots \beta_n V_n + \varepsilon_i \quad (2)$$

b(x) = Propensity score, D = Treatment (1 = received cash, 0 = otherwise), β_o = Intercept of regression equation, β_1-β_n = Estimated regression coefficient, V_1-V_n = Observed covariates and ε_i = Error term.

The next step was the balancing which was conducted to estimate the common support. Each propensity score of the treated group was matched with one control group. Common support is the section that represents the similarity of social-economic characteristics between the two groups based on their similarities in the distribution of their propensity scores (Hotmaida and Purba, 2018). The matching procedure was used to avoid comparing incomparable groups.

The other step was to select the matching algorithm. There are several matching algorithms used, such as the nearest neighbour matching algorithm, kernel matching, radius or calliper matching, stratification matching and mahalanobis metric matching (Lin, 2015; Mao and Li, 2020). The study used the nearest neighbour matching algorithm, radius matching and kernel matching as the algorithm ensures quality matching between treated and control groups.

3.8.1 Estimating the Average Treatment on Treated (ATT)

The next step was to estimate the effect of the conditional cash transfer on the health and education of beneficiaries. Treatment effects are calculated as follows:

$$D = K\left(J_{1i}=1\right) - K_{0i}\left(J_{0i}=1\right) \quad \text{.....(3¿}$$

D = denotes treatment effect, J_{1i} = 1 denotes the CCT beneficiaries, J_{0i} denotes non-beneficiaries, K_{1i} denotes the potential outcome of beneficiaries and K_{0i} denotes the potential outcome of non-beneficiaries. Evaluation of impact in observational studies needs counterfactuals. Therefore, to estimate the average treatment effect on treated it was calculated as follows:

$$ATT = E\left(\frac{K_{1i}}{J}=1\right) - E\left(\frac{K_{0i}}{J}=0\right) \quad \text{.....(4)}$$

ATT denotes the average treatment of the treated group, $E\left(K_{1i}/J=1\right)$ denotes the outcome of the treated group or beneficiary and $E\left(K_{0i}/J=0\right)$ denotes the outcome of the control group or non-beneficiary.

The household health status was measured by using the scale from two measures of access to health services. Two questions were considered: (1) if the household members go to health facilities, and (2) if household members join the Community Health Fund (CHF) and go to health facilities.

$$\ln\left(\frac{\hat{p}}{1-\hat{p}}\right) = H = \beta_0 + \beta_1 D + \beta_2 V_2 + \beta_3 V_3 + \beta_4 V_4 + \beta_5 V_5 + \beta_6 V_6 + \beta_7 V_7 + \beta_8 V_8 + \beta_9 V_9 + \varepsilon_i \quad \text{.....(6)}$$

ln = Natural Logarithm, $\hat{p}$ = Probability of accessing health services, $\frac{\hat{p}}{1-\hat{p}}$ = Probability of not accessing health services, H= Accessing health services (1 Accessing health services, 0 not accessing health services), D = Treatment (1 = received cash, 0 = otherwise), β_o = Intercept of the regression equation, β_1- β_8 = Estimated regression coefficient,

V_2 = Age, V_3 = Sex, V_4 = Marital status, V_5 = Education level, V_6 = Household size, V_7 = Primary source of income, V_8 = Land size , V_9 = Main occupation and ε = Error term.

In the education outcome variable the number of days that students attend school per year was measured. The multiple regression model was used to measure the impact.

$$M = \beta_0 + \beta_1 T + \beta_2 C_2 + \beta_3 C_3 + \beta_4 C_4 + \beta_5 C_5 + \beta_6 C_6 + \beta_7 C_7 + \beta_8 C_8 + \beta_9 C_9 + \varepsilon_i \text{.(7 ¿}$$

M= Education (1 = Attending school, 0 = not attending school), T = Treatment (1 = receiving cash, 0 = otherwise), β_o = Intercept of the regression equation, β_1-β_8 = Estimated regression coefficient, C_2 = Age, C_3 = Sex, C_4 = Marital status, C_5 = Education level, C_6 = Household size, C_7 = Main source of income, C_8 = Land size, C_9 =Main occupation and ε = Error term. Table 3.1 below shows the description of the variables used.

Table 3.1: Description of variables used in the study

Variable	Variable	Nature	Variable Description
Dependent variables			
	Health status	Binary	Accessing health services or not accessing health services.
	Education status	Continuous	The number of days that a student attends school.
Independent variables			
	Age	Continuous	The number of years of household head since born.
	Sex	Categorical	Sex of household head.
	Marital status	Categorical	Marital status of the head of household.
	Education level	Categorical	The time that the head of household spent on formal education.
	Household size	Continuous	The number of members in the household.
	The main source of income	Categorical	The main source of income of the head of household.
	Land size	Continuous	Size of land owned by the head of household.
	Main occupation	Categorical	The main occupation of the head of household.

Source: Authors' conception based on theoretical and empirical review

3.8.2 Sensitivity analysis for human capital investment

According to Rudolph and Stuart (2018), hidden biases caused by unobserved covariates in the study can lead to incorrect effect evaluations. A sensitivity analysis was performed to

check the presence of hidden bias caused by unobserved covariates between treated and control groups. The procedure was used to detect if the impact of the intervention or programme was influenced by hidden bias.

3.9 Results and Discussion

3.9.1 Socio-Economic Characteristics of Respondents

Table 3.2 below indicates the summary of sampled households used in the study based on their social economics characteristics. The results reveal that the majority of respondents were farmers (48%) and dominated by female-headed households (80%).

Table 3.2: Socio-Economic Characteristics of Respondents

Covariate	Description	Control group (%)	Treated group (%)	Total sample (%)
Sex	Female	79	83	80
	Male	21	17	20
Number of meals	1	2	0	1
	2	88	64	79
	3	10	36	20
Education level	Informal	42	47	44
	Primary	57	52	55
	Secondary	1	1	1
Marital status	Married	56	46	52
	Single	3	4	3
	Divorced	8	9	8
	Cohabiting	3	1	2
	Widow	30	40	34
Main occupation	Farming	47	50	48
	Livestock keeping	7	6	6
	Small business	46	44	46

Total households (n=450)

Table 3.2 shows that female-headed households contributed 80 percent of the sampled households and male-headed households contributed 20 percent. In Tanzania, poverty was connected with the sex of the household head; 27.4 percent of basic needs poverty was associated with female-headed households, while 26 percent of basic needs poverty was related to male-headed households (URT, 2019). In addition, female-headed households were more considered in the programme than male-headed households. Moreover, the

education level of the head of household in the study ranged from informal to primary, whereby 55 percent had a primary level of education and 44 percent had informal education. It was claimed by Mok and Jiang (2017) that education was the determinant of personal income and a higher level of education creates a greater chance in the labour market. Low levels of education narrow the opportunities in labour markets hence promoting poverty in the population. Furthermore, the study's respondents were involved in a variety of occupations, with 48 percent being farmers and 46 percent engaged in small businesses. It implies that the majority were farmers, and farming was the main source of income for many households in the study area. According to Kinuthia and Mabaya (2017), the majority of people in Tanzania that rely on farming as the main source of income were poor.

Table 3.3: Age of Household Head, Household Size and Land Size

Covariate	Control group N=279			Treated group N=171			Total sample N=450		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Age (years)	52	20	98	56	20	98	54	20	98
Household size	6	2	12	5	1	12	6	1	12
Land size (acre)	0.84	0	4	0.89	0	4	0.86	0	4

Table 3.3 on average sampled household heads were 54 years old. According to Vera-Toscano *et al*. (2020), in developing countries poverty increases with age. As it is shown that beneficiaries are older than non-beneficiaries this implies that poverty increases with age in the study area. Moreover, the average household size was 6 members while the highest was 12. Poverty increases with an increasing number of household members. In a household with 6 members, 10.2 percent of the members experience food poverty and 28.5 percent experience basic needs poverty (URT (2019). Poor households in the programme were given a basic cash transfer of $5 or TZS 20 000 (URT, 2013). It was anticipated that large household size led to the small impact of cash given because the programme did not

consider the number of household members. Poor households with fewer members benefited from basic cash transfers compared to ones with more members.

3.9.2 Propensity Score estimation

The propensity scores were strictly between 0 and 1, and there was sufficient overlap in the propensity scores between treated and control groups with a large common support region. This means that common support was satisfactory and the balance was achieved between the treated and control groups. The balancing test was conducted and the common support option was selected and the region was (.23592335, .71140465). Figure 3.1 shows the estimated propensity score in the common support.

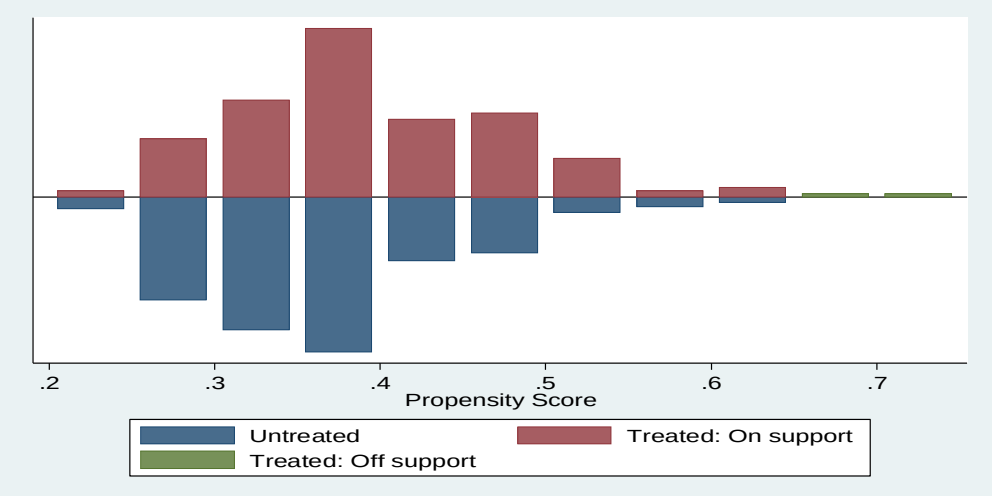

Figure 3.1: Estimated propensity score in the common support region

3.9.3 Covariate balancing in the control and treated groups

The balancing of control and treated groups to meet the condition of comparing matched groups to avoid selection bias is presented in Table 3.4. The two-sample t-test was used for balancing.

Table 3.4: Balancing of covariate of control and treated group

	Control group 279	Treated group 171	
Variable	**Mean/Proportional**	**Mean/Proportional**	**P- Value**
Age	52.279	56.116	0.007
Sex	1.788	1.830	0.278
Marital Status	2.512	2.847	0.060
Education level	2.261	2.432	0.235
Household size	5.716	5.596	0.524
Main occupation	1.992	1.935	0.544
Main income	1.100	1.198	0.045
Land size	0.849	0.894	0.655

Tables 3.4 demonstrate the mean/proportional of covariates and the condition was satisfied at p-value 0.05. It was indicated that most of the variables were balanced between the treated and control groups, which means that the comparisons were conducted on comparable groups as 75 percent of the social-economic characteristics were insignificant at p-value 0.05. This suggests that there was no statistical difference between the treated and control groups.

3.9.4 Impact of conditional cash transfer on access to health services

Table 3.5 depicts the access to health services; from the nearest neighbour matching on average, the programme improves the access to health services by 65 percent at p< 0.01. In the radius and kernel matching, the programme on average improves health access services by 71 percent and 73 percent, respectively at p< 0.01. The effect was highly significant at 1 percent level of significance. On average the programme improves access to health services by 70 percent. Access to cash from CCT has ensured access to health care via joining the Community Health Fund (CHF).

Table 3.5: Impact of conditional cash transfer on access to health services

Outcome variable	**Model Specification**					
	Nearest neighbor		**Radius Matching**		**Kernel Matching**	
	ATT	**P**	**ATT**	**P**	**ATT**	**P**
Access to health services	**0.650**	**0.0005*** **	**0.716**	**0.001*** **	**0.733**	**0.001*** **
Observations						
CCT beneficiary		**169**		**148**		**171**
Non CCT beneficiary		**279**		**279**		**275**

***** p<0.01, ** p<0.05, * p<0.1**

Table 3.5 shows the increase in access to health services by poor household members. The increased access to health services was due to health conditions and the ability of a beneficiary to join a community health fund using the cash provided by the programme. The programme facilitates improving investments in human capital by improving poor households' health status as they can uptake health services all the time whenever they need them. The results were in line with the studies of Mwaita (2018) and Evans *et al*. (2019) which proved that cash transfers in Tanzania assist in increasing the uptake of health insurance and increasing under five-year-old clinic attendance which reduces the number of sick days of the members of the household. Moreover, Dietrich *et al*. (2020) noted that among other things the importance of cash transfer helps to increase child health. Furthermore, improvement in access to health services allows poor households' children to get timely clinic attendance when they are sick which improves their health status in Tanzania (Adhvaryu and Nyshadham, 2015). Having the ability to access health services improved the health status of the family members in the study area as the cash given helped them to afford bills for health services.

3.9.5 Impact of conditional cash transfer on education

Table 3.6 displays that from the nearest neighbour matching on average the programme improves the school attendance of students by 33 days at $p< 0.01$ and the effect was highly at a 1 percent level of significance. In the radius and kernel matching the programme improves school attendance by 31 and 30 days respectively at $p< 0.01$, the effect was highly at a 1 percent level of significance. The students from beneficiary households attend school more than non-beneficiary household students on an average of 32 days.

Table 3.6: Impact of Conditional Cash Transfer on education

Outcome variable	Model Specification					
	Nearest neighbor		Radius Matching		Kernel Matching	
	ATT	P	ATT	P	ATT	P
School attendance	33	0.001***	32	0.001***	30	0.001***
Observations						
CCT beneficiary		169		148		171
Non CCT beneficiary		279		279		275

*** p< 0.01, ** p< 0.05, * p< 0.1

Table 3.6 shows that students from beneficiary households attend school more than non-beneficiary household students on an average of 32 days. Most poor households in Tanzania have children who fail to get opportunities for a better education due to financial constraints (URT, 2013). Although nowadays, education in both primary and secondary schools is free still poor households fail to manage to buy school needs like uniforms, books, shoes and other school bills for their children which constrain them to attend school even if they are ready to start school. This implies that poor households still need assistance to support the education of their children. Findings from Table 3.6 show that the CCT programme has improved school attendance of beneficiaries' children in the study area as the cash given is used to buy school requirements.

The results were in line with the results of Evans *et al*. (2020) who proved that in Tanzania, CCT improves educational outcomes for vulnerable children as it increases school attendance. According to Mwaita (2018); Ng'ong'a (2019); Jacobus *et al*. (2020), cash transfers improve child education for poor households as they spend money on school requirements hence increasing the school attendance of students which directly reduces school dropouts. In addition, Kapama (2017) and Mushi *et al*. (2019) shows that the

initiation of cash transfers in Tanzania improved poor households' children's education in school attendance and increased enrollment as it enabled children to get all their requirements. Before the programme, most of the students were not attending school due to the inability of their families to buy school needs like uniforms and stationaries (URT, 2013). The findings of the study implied that the programme improves access to education for poor households' children as the cash provided was used to buy school needs, which were discouraging children from attending school. It is also assumed that children who will attain education today will handle family needs in the future as education increases the chances of working in labour markets. Moreover, the education obtained helps to increase the number of poor household members that know how to read and write which will help them in their daily life to understand issues in the global view.

3.9.6 Sensitivity analysis for human capital investment

A sensitivity analysis was performed to check the occurrence of hidden bias caused by unobserved covariates between the treated and control groups. The p-critical values of all outcome variables estimated at various levels of critical gamma values are significant at $p<0.05$, indicating that the main covariates influencing conditional cash transfer participation and the outcome variables have been considered and changes in gamma values did not change the study conclusions. Therefore, the positive effect of conditional cash transfer on access to health services and school attendance was not affected by potential hidden bias due to unobserved covariates see Table 3.7.

Table 3.7: Rosenbaum sensitivity analysis for average treatment effect on treated

Rosenbaum bounds for School attendance (N= 450 matched pairs)			**Rosenbaum bounds for access to health services (N= 450 matched pairs)**		
Gamma	**Sig+**	**Sig-**	**Gamma**	**Sig+**	**Sig-**
1	0	0	1	0	0

2	0	0	2	0	0
3	0	0	3	0	0
4	1.1e-16	0	4	0	0
5	8.2e-14	0	5	0	0
6	8.3e-17	0	6	1.7e-14	0
7	2.3e-10	0	7	1.1e-12	0
8	2.8e-09	0	8	2.6e-11	0
9	1.9e-08	0	9	3.0e-10	0
10	9.2e-08	0	10	2.1e-09	0

***Gamma-log odds of differential assignment due to unobserved factors; Sig+ - upper bound significance level; Sig- - lower bound significance level**

3.10 Conclusion and Recommendations

3.10.1 Conclusion

The main objective of this study was to evaluate the impact of conditional cash transfers on human capital investment, especially on health and education among poor households in the Sumbawanga Municipality. The conditional cash transfer programme for the improvement of human capital investments proved to have a significant effect as it improved poor households' access to health services and education. Based on the findings of the study it was clear that the conditional cash transfer programme in the Sumbawanga Municipality has a significant positive impact on improving access to health services and school attendance. The study findings revealed that after the households involved in cash transfers there was an increase in school attendance by 32 days more than children from non-beneficiary households and the ability to access health services due to cash and health insurance increased. In the study area, poor households' health and education status improved which was the aim of the programme to improve poor households' living quality. This suggests that through improvements made by the programme to the health and education of poor households the poverty rate in the study area will decrease as the programme continues.

3.10.2 Recommendations

Therefore, based on the study findings and conclusion, it is recommended that:

i. The Government, Non-Government Organizations (NGOs) and other stakeholders should work together with the conditional cash transfer programme to continue to invest for a long term in the education and health needs of poor households to improve human capital investments in the study area.

ii. The Ministry under the President's Office of Public Services Management and Good Governance through the conditional cash transfer programme should consider increasing the basic cash transfer to households with higher household size.

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CHAPTER FOUR

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Summary of Major Findings

Below is the summary of the major findings as they appear in the presented manuscripts.

4.1.1 Impact of conditional cash transfer on poor household food security

Objective one was aimed at assessing the impact of conditional cash transfers on poor household food security. The study results reveal that there was a positive effect of conditional cash transfer on food security by reducing the use of adverse coping strategies. The matching algorithms used show that on average the programme has a positive effect on the households' coping strategies which ranges from 56 percent to - 60 percent. The findings show that the programme reduces coping strategies in the nearest neighbour matching by 56 percent, in radius and kernel matching by 60 percent at $p< 0.01$ respectively

and the effect was highly significant at 1 percent level of significance. On average the programme improves food security by reducing adverse coping strategies by 59 percent.

In addition, study findings show that the conditional cash transfer programme has a positive effect on poor households' food security by increasing food consumption. The matching algorithms, used show that in the nearest neighbour matching on average the programme improved food security by 43 percent at $p< 0.01$ while in radius and kernel matching food security improved by 49 percent and 48 percent at $p< 0.01$ respectively and the effect was highly significant at 1 percent level of significance. On average the programme improves a household's food security by increasing food consumption by an average of 47 percent.

4.1.2 Impact of conditional cash transfer on poor household health and education.

The objective was to assess the impact of conditional cash transfers on poor households' education and health. The study findings show that the programme improves the health of poor households by increasing access to health services. From nearest neighbour matching on average, the programme improves access to health services by 65 percent at $p<0.01$. Moreover, in the radius and kernel matching the program on average improves health access services by 71 percent and 73 percent respectively at $p<0.01$. The effect was highly significant at a 1 percent level of significance. On average the programme improves access to health services by 70 percent.

In addition, study findings reveal that the programme improves households' education by increasing children's school attendance. From the nearest neighbor matching on average, the programme improves the school attendance of students by 33 days while in the radius and kernel matching by 31 and 30 days respectively at $p<0.01$ and the effect was highly

significant at a 1 percent level of significance. The students from beneficiary households attend school more than non-beneficiary household students on an average of 32 days.

4.2 Conclusions

Based on the findings the study discovered that the conditional cash transfer programme in Sumbawanga Municipality has a positive impact on food security, access to health services and education. The study findings show that on average conditional cash transfer programmes have a significant effect on improving a household's food security by increasing food consumption by 47 percent and reducing adverse coping strategies by 59 percent. Also, the study findings show that on average conditional cash transfer programmes improve human capital investment by increasing access to health services by 70 percent and increasing school attendance by 32 days. The study findings revealed that after the households were involved in a conditional cash transfer programme, the household food security improved by increasing food consumption while reducing adverse coping strategies. This implies that to be a beneficiary was on the safe side to access the social safety nets than non-beneficiary as many poor households in the study area experience food poverty. Through the programme poverty was reduced as the cash given to beneficiaries assists them to meet their food consumption while preventing them from falling into extreme food poverty by improving their access in the long term.

Moreover, the study findings revealed that after the households involved in cash transfers there was an increase in school attendance by 32 days more than children from non-beneficiary households and the ability to access health services due to cash and health insurance increased. In the study area, it is shown that poor households will improve access to health services and education and therefore increases their chances in labour markets. From that fact, there will be a reduction in intergeneration transmissions of poverty from

one generation to another and finally, the highest poverty rate in the study area will be decreased as the programme continues.

4.3 Recommendations

The study has generated some information from which the researcher would like to make some recommendations to different policymakers and potential stakeholders.

i. The Ministry under the President's Office Public Services Management and Good Governance and Non-Government Organizations (NGOs) should continue to support CCT programmes to increase the amount of cash given to poor households. Increasing the amount of money given by CCT programme can support their daily life needs and invest in income-generating activities.

ii. The Government, Non-Government Organizations and other stakeholders have to work together to ensure food prices remain stable and incentives are given to key players to ensure long-term food access.

iii. TASAF has to increase the number of beneficiaries to help more households move out of food poverty in the study area.

iv. The Government, Non-Government Organizations (NGOs) and other stakeholders should work together with the conditional cash transfer programme to continue to invest for a long-term in the education and health needs of poor households to improve human capital investments in the study area.

v. The Ministry under the President's Office Public Services Management and Good Governance through the conditional cash transfer programme should consider increasing the basic cash transfer to households with higher household size.

4.4 Area for Further Studies

The current study used two measures of food security; food consumption score and coping strategies index, future study is needed to use other measures of food security in assessing impact of impact of conditional cash transfer.

APPENDICES

Appendix 1: Questionnaire for Households survey

General Information:

Date: …….Name of respondent……

Division…… Ward: ……..Street……..

Section A: Respondent Background Information

1. Household head's age/year of birth ……
2. Household head's sex ……. [1= Male, 2= Female]
3. Household head's marital status …. [1= Married, 2= Single, 3= Divorced, 4= Cohabiting 5=Widow]
4. Household head's education level …. [1= Primary, 2= Secondary education, 3= Tertiary, 4= None of the above]
5. Household size ……
6. Household head's main occupation …. [1= Farming, 2= Livestock keeping, 3= Small scale business 4= others]

7. The Household main source of cash income …. [1= Business 2= Agricultural]
8. Are you CCT beneficiary …. [0= no, 1= yes]

Section B: Household Farm Characteristics

9. Size of land (acre) owned by household … [1= Less than 1, 2= 1 acres, 3= 2 acres, 4= More than 2 acres]
10. Do you rent land for crops cultivation …[1= yes, 2= No, 3= If yes how much ….]
11. Type of crops cultivated in the amount of land of household own

	Crop	Area cultivated	Amount of harvest in Kg
i)			
ii)			
iii)			

12. How do you store your crops after harvest …. [1= Metal/ earthen containers, 2= Bags, 3= Simple field warehouse, 4= non]
13. For how long the food stored can serve the household … [1=less than a month, 2= More than 1 month, 3= More than 3 months].

Section C: Household Food Security

14. What is the consumption level of your preferred food groups … [1= 2 number of meals, 2= 3 number of meals, 3= More than 3 number of meals]
15. What is your household's main source of food … [1= Own produce through farming activities, 2= Buying, 3= Support from neighbours, 4= Produce from farming and buying]
16. Coping Strategy Index (SCI)

In the past seven days, if there have been times when you did not have enough food or money to buy food, how many days has your household had to:	Frequency: Number of days out of the past seven days 0=not applicable, 1-7 is applicable according to the number of days.	Severity weight 1=Least severe 2=Severe 3=Intermediate severer 4= Most severe	SCI= Frequency x Severity weight

Rely on less preferred and less expensive foods			
Borrow food, or rely on help from a friend or relative			
Purchase food on credit			
Gather wild food, hunt or harvest immature crops			
Consume seed stock held for next season			
Send household members to beg			
Limit portion size at meal times			
Restrict consumption by adults in order for small children to eat			
Sells of assets			
Reduce number of meals eaten in a day			
Skip entire days without eating			
Total CSI			

17. How many days in the last seven days did your household eat the following food types?

S/N	Food Group	Food Items	Weight	Number of Days	Food Consumption Score = Weight x Number of days
1.	Cereals and tubers	Rice, potatoes, wheat, cassava, maize, sorghum	2		
2	Pulses	Beans, groundnuts, peas	3		
3	Milk /Milk product	Milk, yoghurt	4		
4	Fish and meat	Fish, meat, eggs	4		
5	Vegetables and fruits	Green vegetable, fruits	1		
6	Sugar/ honey	Sugar/honey	0.5		
7	Oil	Palm oil, fats,	0.5		

		butter			
Total					

Section D: Household Health

18. Do household have Community Health Fund (CHF) … [1= Yes, 2= No]
19. Do the children under five attend clinic… [1=Yes, 2= No]
20. Do the pregnant women attend clinic … [1=Yes, 2= No]
21. What is the distance from home to a health center …. [1=500 m, 2=1 km, 3= 2 km, 4= More than 2 km]
22. How much time used to reach the health center by walking …. [1=10 minutes, 2=30 minutes, 60 minutes, 4= More than one hour/ 60 minutes]
23. Is the cash transfer enough to support health requirements.… [1= Sufficient, 2= Not sufficient, 3= If not sufficient why ……..]
24. Is household's members go to health facilities when they fall sick … 1= Yes, 2= No]
25. Do you face any challenges to get health services … [1=Yes, 2=No]
    If yes can you mention 3 challenges to access and use services at the health center.
    i)
    ii)
    iii)
26. In your opinion what needs to be done to solve those challenges?
    i)
    ii)
    iii)

Section E: Education

27. How many children are at the age of attending school … [1= 0, 2= 1, 3=2, 4 = More than 2]
28. How many are enrolled to school …. [1=0, 2=1, 3=2, 4=More than 2] If not why ……...……..]
29. Are they attending school regularly (from Monday to Friday) … [1= Yes, 2=No]
    i) If not why ……..…….
    ii) If yes how many days they attend per week ….. [1= 2, 2=3 3= 4, 4=5]
30. There are any children drops out due to lack of services for schooling …. [1=Yes, 2=No]

i) If yes why …….

31. What is the distance from home to school … [1=500 m, 2=1 km, 3=2 km, 4= More than 2 km]
32. How much time used by the childrens to reach the school by walking … [1=10 minutes, 2=30 minutes, 3=60 minutes, 4= More than one hour/ 60 minutes]
33. Before the programme how many children were not enrolled and attending schools … [1= 0, 2= 1, 3= 2, 4=More than 2]
34. Is the cash transfer enough to support school requirements.… [1= Sufficient, 2= Not sufficient, 3= If not sufficient why ……..]

THANK YOU FOR YOUR PARTICIPATION

Appendix 2: STATA Output

Estimation of the propensity score

Iteration 0: log likelihood = -298.82886

Iteration 1: log likelihood = -292.39195

Iteration 2: log likelihood = -292.38066

Iteration 3: log likelihood = -292.38066

Logistic regression — Number of obs = 450

LR chi2(8) = 12.90

Prob > chi2 = 0.1155

Log likelihood = -292.38066 — Pseudo R2 = 0.0216

CCT_Benefi~y	Coef.	Std.Err.	Z	P>z	[95%Conf.	Interval]
age	0.015	0.008	1.930	0.054	-0.000	0.030
sex	0.310	0.261	1.190	0.234	-0.201	0.821
marital_st~s	0.038	0.059	0.650	0.518	-0.077	0.152
eduction_l~d	0.015	0.070	0.210	0.835	-0.123	0.152

Household_~e	-0.009	0.053	-0.160	0.872	-0.112	0.095
main_occup~n	-0.017	0.169	-0.100	0.920	-0.348	0.314
main_income	0.356	0.192	1.850	0.064	-0.021	0.732
land_size	0.001	0.158	0.000	0.997	-0.309	0.310
_cons	-2.325	0.887	-2.620	0.009	-4.062	-0.587

Note: the common support option has been selected
The region of common support is (.23592335, .71140465)

Impact of CCT on household food security by using coping strategic index

ATT estimation with the Nearest neighbor matching

Logistic regression — Number of obs = 450
LR chi2(8) = 12.90
Prob > chi2 = 0.1155
Log likelihood = -292.38066 — Pseudo R2 = 0.0216

CCT_Beneficiary	Coef.	Std.Err.	z	P>z	[95%Conf.	Interval]
age	0.015	0.008	1.930	0.054	-0.000	0.030
sex	0.310	0.261	1.190	0.234	-0.201	0.821
marital_status	0.038	0.059	0.650	0.518	-0.077	0.152
eduction_level_of_household	0.015	0.070	0.210	0.835	-0.123	0.152
Household_size	-0.009	0.053	-0.160	0.872	-0.112	0.095
main_occupation	-0.017	0.169	-0.100	0.920	-0.348	0.314
main_income	0.356	0.192	1.850	0.064	-0.021	0.732
land_size	0.001	0.158	0.000	0.997	-0.309	0.310
_cons	-2.325	0.887	-2.620	0.009	-4.062	-0.587

Variable	Sample	Treated	Controls	ifference	S.E.	P
coping_strateg~x	Unmatched	0.029	0.634	-0.605	0.038	0.001
	ATT	0.030	0.586	-0.556	0.053	0.001

ATT estimation with the Nearest Neighbour Matching

Variable	Sample	Treated	Controls	Difference	S.E.	P
coping_strateg~x	Unmatched	0.029	0.634	-0.605	0.038	0.0005
	ATT	0.027	0.628	-0.601	0.042	0.0005

ATT estimation with the Kernel Matching method

---

n. treat. n. contr. ATT Std. Err. P

171	275	-0.602	0.037	0.0005

Impact of CCT on household food security by using food consumption score

ATT estimation with the Nearest neighbor matching

Logistic regression — Number of obs = 450
LR chi2(8) = 12.90
Prob > chi2 = 0.1155
Log likelihood = -292.38066 — Pseudo R2 = 0.0216

CCT_Beneficiary	Coef.	Std.Err.	Z	P>z	[95%Conf.	Interval]
age	0.015	0.008	1.930	0.054	-0.000	0.030
sex	0.310	0.261	1.190	0.234	-0.201	0.821
marital_status	0.038	0.059	0.650	0.518	-0.077	0.152
eduction_level_of_household	0.015	0.070	0.210	0.835	-0.123	0.152
Household_size	-0.009	0.053	-0.160	0.872	-0.112	0.095
main_occupation	-0.017	0.169	-0.100	0.920	-0.348	0.314
main_income	0.356	0.192	1.850	0.064	-0.021	0.732
land_size	0.001	0.158	0.000	0.997	-0.309	0.310
_cons	-2.325	0.887	-2.620	0.009	-4.062	-0.587

Variable	Sample	Treated	Controls	Difference	S.E.	P
Food_consumpti~e	Unmatched	1.982	1.526	0.455	0.041	0.0005
ATT		1.982	1.556	0.426	0.053	0.0005

ATT estimation with the Radius matching

Variable	Sample	Treated	Controls	Difference	S.E.	P
Food_consumpti~e	Unmatched	1.982	1.495	0.488	0.041	0.001
ATT		1.980	1.493	0.486	0.045	0.001

ATT estimation with the Kernel matching

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n. treat.	n. contr.	ATT	Std. Err.	P
171	275	0.484	0.039	0.0005

Impact of CCT on access to health services

ATT estimation with the Nearest Neighbour matching

Logistic regression — Number of obs = 450

LR chi2(8) = 12.90
Prob > chi2 = 0.1155
Log likelihood = -292.38066 Pseudo R2 = 0.0216

CCT_Beneficiary	Coef.	Std.Err.	Z	P>z	[95%Conf.	Interval]
age	0.015	0.008	1.930	0.054	-0.000	0.030
sex	0.310	0.261	1.190	0.234	-0.201	0.821
marital_status	0.038	0.059	0.650	0.518	-0.077	0.152
eduction_level_of_household	0.015	0.070	0.210	0.835	-0.123	0.152
Household_size	-0.009	0.053	-0.160	0.872	-0.112	0.095
main_occupation	-0.017	0.169	-0.100	0.920	-0.348	0.314
main_income	0.356	0.192	1.850	0.064	-0.021	0.732
land_size	0.001	0.158	0.000	0.997	-0.309	0.310
_cons	-2.325	0.887	-2.620	0.009	-4.062	-0.587

Variable	Sample	Treated	Controls	Difference	S.E.	P
Health_Access_~e	Unmatched	1.760	1.043	0.717	0.055	0.0005
ATT		1.763	1.112	0.651	0.076	0.0005

ATT estimation with the Radius matching

Variable	Sample	Treated	Controls	Difference	S.E.	P
Health_Access_~e	Unmatched	1.760	1.043	0.717	0.055	0.001
ATT		1.764	1.047	0.716	0.062	0.001

ATT estimation with the Kernel matching

n. treat.	n. contr.	ATT	Std. Err.	P
171	275	0.733	0.042	0.001

Impact of CCT on access to health services

ATT estimation with the Nearest Neighbour matching

Logistic regression Number of obs = 450
LR chi2(8) = 12.90
Prob > chi2 = 0.1155
Log likelihood = -292.38066 Pseudo R2 = 0.0216

CCT_Beneficiary	Coef.	Std.Err.	z	P>z	[95%Conf.	Interval]
age	0.015	0.008	1.930	0.054	-0.000	0.030
sex	0.310	0.261	1.190	0.234	-0.201	0.821
marital_status	0.038	0.059	0.650	0.518	-0.077	0.152
eduction_level_of_household	0.015	0.070	0.210	0.835	-0.123	0.152
Household_size	-0.009	0.053	-0.160	0.872	-0.112	0.095

main_occupation	-0.017	0.169	-0.100	0.920	-0.348	0.314
main_income	0.356	0.192	1.850	0.064	-0.021	0.732
land_size	0.001	0.158	0.000	0.997	-0.309	0.310
_cons	-2.325	0.887	-2.620	0.009	-4.062	-0.587

Variable	Sample	Treated	Controls	Difference	S.E.	P
School_attenda~e		104.480	75.602	28.877	6.153	0.001
Unmatched						
ATT		104.858	72.290	32.568	8.123	0.001

ATT estimation with the Radius matching

Variable	Sample	Treated	Controls	Difference	S.E.	P
School_attenda~e		104.480	75.602	28.877	6.153	0.001
Unmatched						
ATT		106.209	74.480	31.730	7.299	0.001

ATT estimation with the Kernel matching

n. treat.	n. contr.	ATT	Std. Err.	P
171	275	30.177	5.823	0.001