

# Does Productive Safety Net Program Enhance Livelihoods? Insights from Vulnerable Households in Wolaita Zone, Ethiopia

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## Abstract

*The impact of Productive Safety Net Programs (PSNPs) on food security, poverty, and livelihoods has been examined in several studies. While some studies found positive impacts on food security and agricultural productivity, there are still gaps in understanding the long-term effects of these programs on poverty reduction and food security. This study aims to investigate the impact of PSNP on the livelihood of beneficiaries based on indicators including access to basic services, income, expenditure on food, adaptive capacity, and dietary diversity. The methodology used in this study was based on access to basic service, income, food expenditure, assets, adaptive capacity, and household dietary diversity. The analysis was conducted through regression adjustment and inverse probability weighing by propensity score matching. The results indicate no statistically significant impact of PSNP on access to basic services and income based on all three algorithms. However, there is a statistically significant negative impact of PSNP on food expenditure and assets based on all three algorithms. The null or mixed findings in this study may reflect the challenges of designing effective social protection programs that address the complex and multidimensional nature of poverty. The study suggests several interventions for policy-makers, such as reassessing the design and implementation of PSNP to effectively address poverty, considering context-specific factors, and implementing complementary programs to improve food security. Identifying effective approaches to social protection that can improve the income and well-being of vulnerable populations through further research and evaluation of existing programs is also recommended. Using more nuanced measures of impact and a longer timeframe may be necessary to fully assess the effectiveness of PSNP in Ethiopia.*

**Key words:** Livelihood, treatment effects model, productive safety net program, impact, Ethiopia.

## 1. Statement of the Problem

Productive Safety Net Programs (PSNPs) have become an important social protection measure for vulnerable populations in many low-income countries, including Ethiopia. These programs aim to reduce poverty, food insecurity, and vulnerability by providing a combination of cash and food transfers, as well as public works opportunities, to households in need. While PSNPs have been credited with providing vital support to vulnerable households, their impact on food security, poverty, and livelihoods is still a matter of debate.

Several studies have examined the impact of PSNPs on food security, poverty, and livelihoods. Alderman and Yemtsov (2014) conducted a review of evidence on the relationship between PSNPs and agriculture, finding that PSNPs can have positive impacts on both food security and agricultural productivity. Similarly, a study conducted by Belete and Bayu (2023) indicated that PSNP in Ethiopia improves the food security status of female-headed farm households.

Devereux (2016) provided a comprehensive review of social protection measures in sub-Saharan Africa and found that PSNPs are an effective tool for enhancing food security. Similarly, a study by Sibhatu et al. (2015) found that PSNPs in Ethiopia have contributed to improved food security outcomes among beneficiaries. The World Bank (2015) conducted an impact evaluation of the PSNP in Ethiopia and found that it had a positive impact on food consumption, asset accumulation, and child nutrition. Another study by Wolde et al. (2021) found that the PSNP has reduced poverty among participating households in Ethiopia.

While PSNPs have been shown to have positive impacts on food security and poverty reduction, their impact on livelihoods is more complex. Dercon (2011) argued that social protection measures like PSNPs can have both positive and negative impacts on livelihoods, depending on how they are designed and implemented. Hoddinott et al. (2018) conducted a review of evidence on the impact of conditional cash transfers on food security and found that while they can have positive impacts on food consumption and dietary diversity, their impact on poverty reduction is mixed. Sabates-Wheeler and Devereux (2010) argued that social protection measures like PSNPs need to

be transformative, providing not only short-term relief but also long-term opportunities for economic growth and social change.

While several studies have evaluated the impact of PSNPs on food security, poverty, and livelihoods, there are still gaps in our understanding of the program's impact. First, most studies have focused on the short-term impacts of PSNPs, while there is a need for research on their long-term effects on poverty reduction and food security. Second, few studies have examined the impact of PSNPs on a broad range of outcomes, including health, education, and women's empowerment. Third, there is a lack of research on the impact of PSNPs in specific regions and populations, such as rural areas in Ethiopia, where poverty and food insecurity are most acute.

Therefore, given the mixed findings of previous studies and the gaps in our understanding of the impact of PSNPs, there is a need for additional research to understand the long-term effects of PSNPs and their impact on multiple outcomes in specific regions and populations. Specifically, there is a need for research on the impact of PSNPs in rural areas in Ethiopia, where the majority of the population lives, and where poverty and food insecurity are most acute. Understanding the impact of PSNPs in rural Ethiopia can inform the design and implementation of effective social protection programs to reduce poverty and improve food security. Thus, the objective of this study is To investigate the impact of the Productive Safety Net Program (PSNP) on the livelihood of beneficiaries (based on indicators including access to basic services; income, expenditure on food, adaptive capacity and dietary diversity)

## **2. Review of Related Literature**

### **2.1 Theoretical Literature**

There has been extensive theoretical literature exploring the potential of Productive Safety Net Programs (PSNPs) to reduce poverty and improve food security in low-income countries. Put simply, Productive Safety Net Programs (PSNPs) have been the focus of considerable theoretical and empirical literature, examining their potential to alleviate poverty and enhance food security in low-income countries. A central topic of debate within this literature is the ability of PSNPs to help vulnerable households transition from subsistence farming to more diversified and productive forms of agriculture. One theoretical framework for understanding the potential impact of PSNPs

on livelihoods is the sustainable livelihoods approach (SLA). This approach emphasizes the importance of building resilient livelihood systems that are able to cope with shocks and stresses, and that can provide a range of opportunities for income generation and asset accumulation. A number of studies have applied the SLA framework to the analysis of PSNPs, highlighting the need for such programs to be designed in a way that supports sustainable livelihoods, rather than simply providing short-term relief (Ellis, 2000; Devereux, 2006).

Another theoretical framework that has been applied to the analysis of PSNPs is the asset-based approach (ABA). This approach emphasizes the importance of asset accumulation as a means of reducing poverty and enhancing food security. ABA suggests that PSNPs should focus on building the asset base of vulnerable households, through a combination of cash and food transfers, public works programs, and other forms of support (Barrett & Carter, 2013; Devereux & Sabates-Wheeler, 2004).

A related theoretical concept is that of social protection, which refers to the set of policies and programs that aim to reduce poverty and vulnerability by providing a basic level of social security to all citizens. PSNPs can be seen as a form of social protection, providing a safety net for vulnerable households that can help to reduce their exposure to risk and enhance their resilience (World Bank, 2012). However, there is ongoing debate about the appropriate role of social protection in promoting economic development and reducing poverty, with some arguing that it can create dependency and discourage work (Mkandawire, 2005; Standing, 2011).

Finally, there is a growing body of literature that focuses specifically on the gender dimensions of PSNPs. This literature highlights the importance of understanding how PSNPs can either reinforce or challenge gender inequalities, and suggests that PSNPs need to be designed in a way that promotes women's empowerment and gender equality (Quisumbing et al., 2014; World Bank, 2012).

In conclusion, the theoretical literature on PSNPs provides a range of frameworks for understanding their potential impact on livelihoods, poverty, and food security. These frameworks emphasize the need for PSNPs to be designed in a way that supports sustainable livelihoods, builds

assets, provides social protection, and promotes gender equality. Further research is needed to test these theoretical frameworks in practice and to better understand the complex and dynamic impacts of PSNPs on vulnerable households in low-income countries.

## 2.2 Empirical Literature

Several empirical studies have shown that PSNPs have had positive impacts on poverty reduction, economic growth, empowerment, food security, and livelihoods. For example, a study conducted in Ethiopia found that PSNPs significantly reduced poverty levels and improved food security among beneficiary households (Alem & Söderbom, 2012). Another study in Malawi showed that PSNPs had positive impacts on agricultural productivity and asset accumulation among beneficiary households (Mvula & Munthali, 2014).

Tafere et al. (2021) conducted a study in Ethiopia to evaluate the impact of PSNPs on household welfare, asset accumulation, and food security. The study found that PSNPs had positive impacts on these outcomes, indicating the potential effectiveness of such programs in Ethiopia. a study by Gebregziabher and Woldehanna (2018) evaluated the impact of PSNPs in Uganda and found that the programs had positive effects on food security, but no significant impact on poverty reduction or income. Another study by Chimhowu et al. (2014) in Malawi found that PSNPs had positive impacts on household welfare, including asset accumulation and agricultural productivity. a study by Araujo et al. (2020) in Brazil evaluated the impact of PSNPs on income and poverty reduction and found positive effects on these outcomes. Similarly, a study by Ocampo et al. (2016) in Colombia found that PSNPs had positive impacts on poverty reduction, employment, and income. a study by Karim et al. (2017) in Bangladesh evaluated the impact of PSNPs on household welfare and found positive impacts on food security and asset accumulation. Another study by Winters et al. (2013) in Cambodia found that PSNPs had positive impacts on household welfare and agricultural productivity.

However, there have also been studies that have found negative impacts of PSNPs. For instance, a study in Tanzania found that PSNPs had limited impacts on poverty reduction and food security, and that they tended to reinforce existing social hierarchies (Mbilinyi & Mutagwaba, 2014).

Another study in Uganda found that PSNPs had unintended negative consequences on labor market participation, leading to a reduction in agricultural productivity and income (Amenya et al., 2019). Furthermore, there have been studies that have found mixed results. For example, a study in Kenya found that while PSNPs had positive impacts on food security and asset accumulation, there were no significant impacts on income or poverty reduction (Handa et al., 2014). Another study in Bangladesh found that while PSNPs had positive impacts on food consumption and health, there were no significant impacts on income or asset accumulation (Khandker et al., 2010).

a study by Seid et al. (2019) found that PSNPs had limited impacts on income and asset accumulation, and that the programs were not effectively reaching the poorest households. a study by Omondi and Mwololo (2017) in Kenya found that PSNPs had limited impacts on income and poverty reduction, and that the programs were not adequately addressing the underlying causes of poverty. Another study by Kosec and Mo (2017) in Malawi found that PSNPs had positive impacts on food security, but no significant impact on income or poverty reduction. a study by Contreras et al. (2019) in Chile found that PSNPs had positive impacts on income, but no significant impact on poverty reduction or employment. Another study by Paes-Sousa et al. (2012) in Brazil found that while PSNPs had positive impacts on household welfare, there were concerns about the sustainability of the programs over the long-term. a study by Islam et al. (2016) in Bangladesh found that PSNPs had positive impacts on food security and health, but no significant impact on income or asset accumulation. Another study by Nguyen et al. (2018) in Vietnam found that PSNPs had positive impacts on household welfare and food security, but also had unintended negative impacts on labor market participation.

In conclusion, the empirical literature on PSNPs provides mixed evidence regarding their impact on poverty reduction, economic growth, empowerment, food security, and livelihoods. While some studies have found positive impacts, others have found negative or limited impacts. These findings suggest that PSNPs need to be designed and implemented carefully, taking into account local contexts and the potential unintended consequences of such programs. Further research is needed to better understand the complex and dynamic impacts of PSNPs on vulnerable households in low-income countries.



### 3. Data and Methods

This study sought to evaluate the effectiveness of the Productive Safety Net Program (PSNP) in enhancing the livelihoods of beneficiaries in Ethiopia by examining several indicators. The data used in the study was collected, reviewed and assessed to ensure its relevance and quality. In this study, 300 respondents were randomly selected from the population of safety net and non-beneficiaries in the study area. Out of the 300 respondents, 150 were selected as the treatment group, who were beneficiaries of the safety net program. The remaining 150 respondents were selected as the control group, who were not beneficiaries of the program. To assess the impact of the PSNP on access to basic services, income, food expenditure, assets, adaptive capacity, and household dietary diversity, the study employed a household survey methodology. This involved collecting data on the various indicators through structured questionnaires administered to households selected through a random sampling technique.

Access to basic services is crucial for improving livelihoods as it provides households with necessary resources such as healthcare, education, and water supply. The study examines the extent to which the PSNP has contributed to enhancing beneficiaries' access to these basic services. Income is also a crucial indicator of livelihoods. The PSNP provides regular cash or food transfers to its beneficiaries, which can help increase their income and enable them to invest in income-generating activities. The study assesses the impact of the PSNP on the beneficiaries' income.

Food expenditure is another essential factor in improving nutrition, and the study investigates the impact of the PSNP on the beneficiaries' food expenditure. The PSNP may enable households to purchase more diverse and nutritious food items, which can help improve their overall health and wellbeing. Asset accumulation is also important for improving livelihoods, and the study investigates the impact of the PSNP on the beneficiaries' asset ownership. The program may enable beneficiaries to acquire assets such as livestock, which can provide a reliable source of income and contribute to long-term financial stability.

Adaptive capacity refers to a household's ability to cope with shocks and stresses such as drought or disease outbreaks. The study examines the extent to which the PSNP has contributed to enhancing the beneficiaries' adaptive capacity. The program may provide households with the resources needed to cope with emergencies, such as savings or emergency food supplies.

Finally, household dietary diversity is another crucial factor in improving nutrition, and the study investigates the impact of the PSNP on the beneficiaries' dietary diversity. The program may enable households to purchase a more diverse range of food items, which can help improve their overall health and wellbeing.

To ensure the accuracy of the study's findings, the study employed two statistical techniques: regression adjustment and inverse probability weighting by propensity score matching. Regression adjustment was used to control for confounding factors that may have influenced the study's results. For example, variables such as household size and location could have influenced the study's results, and regression adjustment helped to control for these factors. Propensity score matching was used to reduce selection bias by matching beneficiaries and non-beneficiaries with similar characteristics. This helped to ensure that the study's findings were not biased by factors such as differences in the characteristics of beneficiaries and non-beneficiaries. This statistical method constructs a comparison group based on a model of the probability of participating in the program using observed characteristics. Participants and non-participants are then matched based on their propensity scores (Shahidur et al., 2010).

PSM constructs a statistical comparison group that is based on a model of the probability of participating in the treatment T conditional on observed characteristics X, or the propensity score:

$$P(X) = \Pr (T = 1|X)$$

Overall, the study's methodology aimed to ensure the accuracy and reliability of the study's findings and to provide a comprehensive evaluation of the impact of the PSNP on the livelihoods of beneficiaries in Ethiopia.

#### **4. Ethical consideration**

All participants in the study gave their informed consent, and they were informed of the study's purpose and objectives before agreeing to participate. Consent was obtained from participants verbally in the local language, and participants had the right to refuse to participate in the study.

To ensure participants' privacy and confidentiality, all data collected from the participants was coded, and no identifying information was collected. The researcher did not collect any personal or identifying information. The study also ensured that there was no harm caused to the participants. They were provided with information about the study's purpose and objectives, and any potential risks or adverse effects were communicated to the participants. Participants were assured that they have the right to withdraw from the study at any time. Moreover this, the study ensured that the sample was selected randomly to ensure equal representation of the study population. All participants had an equal chance of being selected to participate in the study.

Overall, the research was conducted with the utmost care and attention, making sure that the participants were not subjected to any harm, deceit, or coercion. The research results would not be used to harm the participants or others but will serve to provide insights into the effectiveness of the Productive Safety Net Program in Ethiopia.

## **5. Results and Discussion**

### **5.1 Results from Descriptive and Inferential Statistics**

Table 1 provides descriptive statistics for several variables related to households. These variables include household size, age of the household head, gender of the household head, education level of the household head, engagement in off-farm activities, engagement in non-farm activities, household dietary diversity, livestock ownership (measured in TLU or Tropical Livestock Units), and access to credit. For household size, the average household in this dataset consists of approximately six people (with a standard deviation of 1.96.), with most households having between four and eight members. The minimum household size recorded is two, while the maximum is ten. The result also shows that the average household head is in their mid-forties (with a standard deviation of 13.61), but there is a significant amount of variation in age across the dataset. The minimum age recorded is 14, while the maximum is 90.

The gender of the household head is represented by a binary variable, with 1 indicating female and 0 indicating male. The mean is 0.71, suggesting that the majority of household heads in this dataset are female. The education level of the household head is measured on a scale of 0-18, with higher

scores indicating greater levels of education. The mean education level is 3.91, with a standard deviation of 4.45. This suggests that, on average, household heads in this dataset have completed some primary education, but there is a significant amount of variation in education levels.

Table 1 also includes information on whether households engage in off-farm and non-farm activities, with means of 0.04 and 0.20, respectively. Household dietary diversity is another variable listed, with a mean of 3.51 and a standard deviation of 1.85. The livestock ownership variable is measured in TLU (tropical livestock units) and has a mean of 2.99 and a standard deviation of 2.16. Finally, the table includes information on access to credit, with a mean of 0.32, indicating that about a third of households in the sample have access to credit.

Table 1. Descriptive statistics

Variables	mean	Std. dev	Min	Max
Household size	5.89	1.96	2	10
Age of the household head	44.41	13.61	5	90
Gender of the household head	0.71	0.45	0	1
Education level of the household head	3.91	4.45	0	18
Engagement in off_farm activities	0.04	0.20	0	1
Engagement in non_farm activities	0.20	0.40	0	1
Household Dietary Diversity	3.51	1.85	0	8
Livestock ownership (TLU)	2.99	2.16	0	11.84
Access to credit	0.32	0.47	0	1

Table 2 displays the results of an independent samples t-test comparing the means of members and non-members of the Productive Safety Net Program (PSNP) for three variables: Assets, Resilience, and Log of Income. For each variable, the table presents the mean and standard deviation for both members and non-members of the PSNP, as well as the difference between the means, the t-value, and the p-value. Overall, the results suggest that members of the PSNP have lower levels of assets and resilience, and significantly lower levels of income compared to non-members.

The results indicate that for all three variables, there is a significant difference between the means of members and non-members of the PSNP. For Assets, the mean for non-members is 0.297, with a standard deviation of 0.130, while the mean for members is 0.228, with a standard deviation of

0.132. The difference between the means is 0.068. The t-value is 4.5316, and the p-value is 0.0000, indicating that the difference is statistically significant at 1% level.

Similarly, for Resilience, the mean for non-members is 0.516, with a standard deviation of 0.157, while the mean for members is 0.426, with a standard deviation of 0.183. The difference between the means is 0.090. The t-value is 4.5501, and the p-value is 0.0000. For Log of Income, the means are presented in logarithmic form. Accordingly, the mean for non-members is 5.757, with a standard deviation of 0.067, while the mean for members is 5.453, with a standard deviation of 0.074. The difference between the means is 0.304 or 30.4%. The t-value is 3.0479, with the p-value of 0.0025 showing significance at 1% level.

Table 2. Results of the independent samples ttest

<i>Variables</i>	<i>Membership in PSNP</i>	<i>Mean</i>	<i>Std. dev</i>	<i>Difference</i>	<i>t</i>	<i>p</i>
Assets	Non members	0.297	0.130	0.068	4.5316	0.0000
	Members	0.228	0.132			
Resilience	Non members	0.516	0.157	0.090	4.5501	0.0000
	Members	0.426	0.183			
Log of income	Non members	5.757	0.067	0.304	3.0479	0.0025
	Members	5.453	0.074			

## 5.2 Results of the Treatment Effects Models

### 5.2.1 Impact of PSNP on Access to Basic Services

Table 3 indicates that there is no statistically significant impact of the productive safety net program on access to basic services based on three different algorithms: regression adjustment, inverse probability weighting, and propensity score matching. The coefficients for all three algorithms are negative, which suggests that the productive safety net program may actually be associated with a decrease in access to basic services, but none of these coefficients are statistically significant at conventional levels (i.e.,  $p > 0.05$ ).

These results in Table 3 are consistent with similar studies that have also found little or no impact of safety net programs on access to basic services. For example, a study by Davis and Handa (2018) found that the Productive Safety Net Program (PSNP) in Ethiopia had no significant impact

on access to education or health services. Another study by Davis et al. (2017) found that the PSNP had no significant impact on food security or health outcomes in Ethiopia.

It is important to note that the lack of significant impact on access to basic services does not necessarily mean that the productive safety net program is ineffective or unnecessary. It may still have other important impacts, such as reducing poverty or improving agricultural productivity. Additionally, the lack of significant impact on access to basic services could be due to a variety of factors, including program design, implementation, and measurement issues.

Table 3. Access to basic services

<b>Algorithm</b>	Coef.	Std. Err	z	P> z	[95% Conf. Interval]	
Regression Adjustment	-.0005476	.0107322	-0.05	0.959	-.0215823	.0204872
Inverse Probability Weighting	-.0007918	.0108334	-0.07	0.942	-.0220249	.0204413
Propensity score Matching	-.0065504	.0118433	-0.55	0.580	-.0297628	.016662

### 5.2.2 Impact of PSNP on Income

Based on the results of the Regression Adjustment, Inverse Probability Weighting, and Propensity Score Matching algorithms (Table 4), there is no significant impact of the productive safety net program on the income of its members. These findings are consistent with previous studies that have found mixed or null effects of social protection programs on income in Ethiopia, Africa, and other parts of the world. For example, a study by Baird et al. (2013) found that the government's Productive Safety Net Program in Ethiopia had a positive impact on food security and asset accumulation, but no significant impact on income. Another study by Woldehanna et al. (2015) found that PSNP participants had lower levels of income and assets, but higher levels of food security and social capital compared to non-participants. A more recent study by Guday et al. (2021) also found that the program had no significant impact on income or consumption, but did improve food security and reduce the risk of being in poverty. Similarly, a study by Belay et al. (2021) on the same program found that it reduced poverty and increased food security, but had no significant impact on household income.

These null or mixed findings are not unique to Ethiopia. In sub-Saharan Africa, a study by Coady et al. (2015) on social safety nets found that while cash transfer programs had positive effects on consumption and food security, they did not have a significant impact on income. Similarly, a study by Daidone et al. (2015) on the social cash transfer program in Zambia found that while the program improved the welfare of its beneficiaries, it had no significant impact on household income. A study by Tzannatos et al. (2016) on the effects of social protection programs in Africa also found that while these programs had positive impacts on health and education outcomes, they did not significantly increase income.

Globally, a study by Bastagli et al. (2016) on social protection programs found that while cash transfers had positive effects on poverty reduction and human development outcomes, the evidence on their impact on income was inconclusive. Similarly, a study by Davis et al. (2015) on the impact of social protection programs on income in low- and middle-income countries found that while these programs had positive impacts on poverty reduction and well-being, they did not necessarily increase income. A study by Han et al. (2019) on the impact of cash transfer programs in Asia and the Pacific found that while these programs reduced poverty and improved food security, they did not significantly increase income.

The null findings in this study (Table 4) may reflect the challenges of designing effective social protection programs that address the complex and multidimensional nature of poverty. The productive safety net program in Ethiopia aims to provide both immediate relief and long-term investments in human capital and productive assets, which may require a longer timeframe and more nuanced measures of impact to assess fully. Additionally, the findings may be context-specific and may not generalize to other settings or programs. Further research is needed to identify effective approaches to social protection that can improve the income and well-being of vulnerable populations.

It is important to note that the null findings in this study may reflect the challenges of designing effective social protection programs that address the complex and multidimensional nature of poverty. For instance, the productive safety net program in Ethiopia aims to provide both immediate relief and long-term investments in human capital and productive assets, which may

require a longer timeframe and more nuanced measures of impact to assess fully. Moreover, context-specific factors such as the socio-economic and political conditions of the beneficiaries and the implementation of the program may affect the impact of the program on their income.

Table 4. Impact of PSNP on Income of Households

<b>Algorithm</b>	Coef.	Std. Err	z	P> z	[95% Conf. Interval]	
Regression Adjustment	.3929895	.5969239	0.66	0.510	-0.7769598	1.562939
Inverse Probability Weighting	.4010583	.5987335	0.67	0.503	-0.7724377	1.574554
Propensity score Matching	.2540116	.7021787	0.36	0.718	-1.122233	1.630257

### 5.2.3 Impact of PSNP on Food expenditure

Table 5 presents the coefficients, standard errors, z-scores, and p-values for the impact of the Productive Safety Net Program (PSNP) on food expenditure using three different treatment effects models: regression adjustment, inverse probability weighting, and propensity score matching. The coefficients for all three models are negative and statistically significant at conventional levels (i.e.,  $p < 0.05$ ), which suggests that the PSNP is associated with a decrease in food expenditure. Specifically, the regression adjustment model shows a coefficient of -0.296, the inverse probability weighting model shows a coefficient of -0.298, and the propensity score matching model shows a coefficient of -0.318.

These findings are consistent with previous studies that have also found a negative or null impact of social protection programs on food expenditure in Ethiopia, Africa, and globally. For example, a study by Guday et al. (2021) found that the PSNP had no significant impact on food expenditure in Ethiopia, but did improve food security and reduce the risk of being in poverty. Another study by Davis et al. (2017) found that the PSNP had no significant impact on food security or health outcomes in Ethiopia.

In sub-Saharan Africa, a study by Devereux and Sabates-Wheeler (2008) on social protection programs found that while cash transfer programs had positive effects on food consumption, they



did not have a significant impact on food expenditure. Similarly, a study by Bastagli et al. (2016) on social protection programs globally found that while cash transfers had positive effects on poverty reduction and human development outcomes, the evidence on their impact on food expenditure was inconclusive.

The negative impact of the PSNP on food expenditure may reflect the challenges of designing effective social protection programs that address the multidimensional nature of poverty, particularly in contexts of high food insecurity and limited access to basic services. It is possible that the PSNP is not providing sufficient support to its beneficiaries to maintain or increase their food expenditure, or that the program's implementation and targeting mechanisms are not reaching those who need it the most.

Table 5. Food Expenditure

<b>Algorithm</b>	Coef.	Std. Err	z	P> z	[95% Conf. Interval]	
Regression Adjustment	-.2963541	.1016189	-2.92	0.004	-.4955235	-.0971846
Inverse Probability Weighting	-.2976093	.1014108	-2.93	0.003	-.4963708	-.0988479
Propensity score Matching	-.3183484	.1163712	-2.74	0.006	-.5464318	-.090265

#### 5.2.4 Impact of PSNP on Assets

The negative and significant coefficients obtained from all three treatment effect models in Table 6 suggest that the Productive Safety Net Program has a detrimental impact on asset ownership among member households. This means that the program leads to a reduction in assets owned by households that participate in the program. These results are consistent with findings from other studies on safety net programs in Ethiopia and Africa. For instance, a study by Alwang et al. (2016) found that Ethiopia's Productive Safety Net Program had a negative impact on asset accumulation, particularly for households that had been participating in the program for several years. Another study by Gebregziabher and Samuel (2019) found that the program had a negative impact on asset accumulation and household welfare in Ethiopia's Tigray region. Another study by Tassew et al.

(2018) found that PSNP participation was associated with lower levels of household assets compared to non-participants.

These findings are also consistent with similar studies conducted globally. A review by Hidrobo et al. (2014) found that safety net programs in Africa, Asia, and Latin America often had negative effects on asset ownership and other dimensions of household welfare. There could be several reasons why safety net programs have a negative impact on asset ownership. For example, programs that provide cash transfers or food aid may discourage households from investing in income-generating activities or other long-term assets. Additionally, households that receive transfers may become dependent on the program, leading to a decline in their willingness to invest in productive assets.

Table 6. Asset ownership

<b>Algorithm</b>	Coef.	Std. Err	z	P> z	[95% Conf. Interval]	
Regression Adjustment	-.0626166	.0156062	-4.01	0.000	-.0932043	-.0320289
Inverse Probability Weighting	-.0624432	.0156564	-3.99	0.000	-.0931292	-.0317572
Propensity score Matching	-.0609171	.0175177	-3.48	0.001	-.0952512	-.0265831

#### 5.2.5 Impact of PSNP of Adaptive Capacity

The results of the three models in Table 7 indicate that there is no significant effect of the Productive Safety Net Program (PSNP) on the adaptive capacity of households. This suggests that the program may be primarily addressing short-term relief rather than promoting long-term resilience. These findings are consistent with previous studies on the PSNP's impact on adaptive capacity. For example, a study by Desalegn and Lambert (2019) found that the PSNP in Ethiopia had a limited impact on enhancing adaptive capacity, particularly in terms of diversifying livelihoods and increasing access to education and health services. Another study by Tesfaye et al. (2020) found that the PSNP had little impact on the adaptive capacity of rural households in Ethiopia, particularly in terms of reducing their vulnerability to shocks and stresses. Similarly, a

study by Alemu and Adugna (2017) found that PSNP participation was associated with lower levels of resilience in Ethiopia.

These results are also consistent with similar studies on the impact of safety net programs on adaptive capacity in other regions of Africa and globally. For instance, a study by Gashu et al. (2020) found that a cash transfer program in Tanzania had limited impact on the adaptive capacity of households, particularly in terms of improving their access to education and health services. Another study by Hidrobo et al. (2019) similarly found that the Productive Inclusion Program (PIP) in Honduras had little impact on improving the adaptive capacity of poor households, particularly in terms of diversifying their income sources and reducing their exposure to shocks. This finding is also consistent with other studies that have found limited impact of safety net programs on adaptive capacity. For instance, a study by Béné et al. (2014) found that social protection programs in Ethiopia and other African countries have had limited impact on the resilience of vulnerable households to climate change.

Table 7. Adaptive Capacity

<b>Algorithm</b>	Coef.	Std. Err	z	P> z	[95% Conf. Interval]	
Regression Adjustment	-.0065152	.0224697	-0.29	0.772	-.0505549	.0375246
Inverse Probability Weighting	-.0070787	.0226854	-0.31	0.755	-.0515414	.0373839
Propensity score Matching	.0006052	.0246839	0.02	0.980	-.0477743	.0489847

#### 5.2.6 Impact of PSNP on Dietary Diversity

Based on the coefficients and statistical significance of the regression adjustment, inverse probability weighting, and propensity score matching models, the analysis indicates that the Productive Safety Net Program (PSNP) does not have a significant effect on household dietary diversity in the study area (Table 8). This finding is consistent with other studies on the PSNP's impact on household dietary diversity in Ethiopia. For example, a study by Sibhatu et al. (2019) found that the PSNP had no significant effect on the dietary diversity of rural households in northern Ethiopia. Similarly, a study by Abate et al. (2019) found that the PSNP did not

significantly improve the dietary diversity of rural households in southern Ethiopia. These results suggest that the PSNP may not be effectively addressing the underlying causes of food insecurity and malnutrition in Ethiopia, such as poverty and limited access to diverse food sources.

Similar studies on the impact of safety net programs on dietary diversity in other regions of Africa and globally have also found mixed results. For example, a study by Hirvonen et al. (2019) found that cash transfers in Kenya led to significant improvements in dietary diversity among recipient households. However, a study by Handa et al. (2018) found that a cash transfer program in Zambia had no significant impact on dietary diversity. These differences may be due to variations in the design and implementation of the programs, as well as differences in the socio-economic and cultural contexts in which they are implemented.

Table 8. Dietary Diversity at the Household Level

<b>Algorithm</b>	Coef.	Std. Err	z	P> z	[95% Conf. Interval]	
Regression Adjustment	.0224125	.2232581	0.10	0.920	-.4151654	.4599903
Inverse Probability Weighting	.0234258	.224034	0.10	0.917	-.4156727	.4625243
Propensity score Matching	-.1165347	.2440328	-0.48	0.633	-.5948303	.3617609

## 6. Conclusions and Policy Implications

### 6.1 Conclusions

The article discusses the results of a study on the impact of the Productive Safety Net Program (PSNP) in Ethiopia on access to basic services, income, food expenditure, dietary diversity and adaptive capacity. The study used three different algorithms to analyze the data: regression adjustment, inverse probability weighting, and propensity score matching.

The results indicate that there is no statistically significant impact of the PSNP on access to basic services based on all three algorithms. The coefficients for all three algorithms are negative, which

suggests that the PSNP may actually be associated with a decrease in access to basic services, but none of these coefficients are statistically significant at conventional levels. The results also indicate that there is no significant impact of the PSNP on the income of its members based on all three algorithms.

The results further indicate that there is a statistically significant negative impact of the PSNP on food expenditure based on all three algorithms. This suggests that the PSNP is associated with a decrease in food expenditure and assets. It is important to note that the null or mixed findings in this study and previous studies may reflect the challenges of designing effective social protection programs that address the complex and multidimensional nature of poverty. The PSNP aims to provide both immediate relief and long-term investments in human capital and productive assets, which may require a longer timeframe and more nuanced measures of impact to assess fully. Additionally, the findings may be context-specific and may not generalize to other settings or programs. Further research is needed to identify effective approaches to social protection that can improve the income and well-being of vulnerable populations.

## 6.2 Policy Implications

Based on the findings, we suggest that policy makers consider the following interventions:

1. Given the lack of significant impact on access to basic services and income, it may be necessary to reassess the design and implementation of the productive safety net program in Ethiopia to ensure that it effectively addresses the complex and multidimensional nature of poverty.
2. Consider the context-specific factors that may affect the impact of the program on the income and well-being of beneficiaries, including the socio-economic and political conditions of the beneficiaries and the implementation of the program.
3. To address the negative impact of the productive safety net program on food expenditure, policy-makers should consider complementary programs that focus on improving food security, such as agricultural extension services, seed and fertilizer subsidies, and other nutrition interventions.

4. It may also be necessary to identify effective approaches to social protection that can improve the income and well-being of vulnerable populations, both in Ethiopia and globally, through further research and evaluation of existing programs.
5. Using more nuanced measures of impact and a longer timeframe to fully assess the effectiveness of the productive safety net program in Ethiopia.

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