Analyzing the Effectiveness of the Productive Safety Net Program (PSNP) of Ethiopia: Evidence from the Literature

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Major

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Dedication

I dedicate this paper to the Ethiopian people who are affected by man-made and natural factors, dislocated from their homes, live in tents, and need daily food assistance.

Acknowledgments

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List of acronyms

ASFs   Animal Source of Foods

BMI   Body Mass Index

CSA   Central Statistical Authority

CMB   Common Method Bias

DD   Dietary Diversity

DL   DerSimonian and Laird

EUR   Erasmus University Rotterdam

ERHS   Ethiopian Rural Household Survey

FAO   Food and Agriculture Organization

FAD   Food Availability Decline

FED   Food Entitlement Decline

FGDs   Focus Group Discussions

GPS   Graduation Prediction System

HABP   Household Asset Building Program

HAZ   Height-for-Age-Z-score

HDDS   Household Dietary Diversity Score

HHs   Households

KII   Key Informant Interview

MAD   Minimum Acceptable Diet

MH   Mantel-Haenszel Method

NW   Northwest

OKP   Orange Knowledge Program

PRISMA   Preferred Reporting Items for Systematic Review and Meta-Analyses

PSM   Propensity Score Matching

PSNP   Productive Safety Net Program

PWs   Public Works

RR   Risk Ratio

RRs   Relative Risks

SLM   Sustainable Land Management

TPLF   Tigray People Liberation Front

UN   United Nation

UK   United Kingdom

WB   World Bank

Glossary of local terms

Woreda: In Ethiopian regions, woreda referred to as districts, are third-level administrative units after zones of regional states. They are made up of the council the executive and the judicial branch.

Zone: are administrative sub-divisions situated above woredas or districts and below regions. In Ethiopia, regions are separated into zones.

Abstract

In PSNP literature, some authors argue that the program had little effect on food security while others recognized the programs beneficial contribution. However, it was unclear who was benefiting from the scheme. Thus, this study is aimed to analyzes the contradictory findings on the PSNP produced by several studies. The study used a critical literature review methodology with meta-analysis, examining 37 chosen papers (22 and 15 respectively), to address the reason for differences across the studies and pinpoint knowledge gaps. Due to methodological variations, research bias, temporal and contextual factors, and the variation of the procedure in data collection and analysis, the study finds great deal of variation in PSNP results. The meta-analysis has been conducted by using the DerSimonian and Laird (DL) random effect model. The result shows that the PSNP has significant protective impact reducing the probability of negative outcomes by almost 63%. The significant heterogeneity ($I^2 = 99.9\%$) highlights how the program's effectiveness is impacted by regional variations, demographic characteristics, and implementation strategy. To produce precise and useful insights, the study emphasizes the significance of transparent and accurate research methodologies. Additionally, it highlights the necessity of context specific approaches to maximize PSNP's influence especially in various socio-economic circumstances. The results indicate that the PSNP has broad benefits, local implementation and ongoing assessment are necessary for its effectiveness. For future studies, this paper suggests using primary data with longitudinal studies and time series analysis combined to gain deeper understanding on programs changing dynamics. The research with larger geographical and demographic ranges is also required to improve the validity and generalizability of the results.

Relevance to Development Studies

As it tackles crucial topics like food security, social protection, and poverty alleviation-three major subjects in development studies, the study on Ethiopia's PSNP is extremely relevant to this area. The major goal of development studies is to comprehend and address complex issues that developing countries face. Thus, this study offers important new information about how well PSNPs work to accomplish these objectives. In the first place, Ethiopia has experienced persistent food insecurity and poverty because of internal displacement and drought. The PSNP is the major effort meant to alleviate these issues and provide food security in Ethiopia. The paper offers data on how the program can lessen these difficulties by examining the PSNP. This is necessary for research on development studies, which look for practical ways to raise marginalized groups' living standards.

Rigorous methodology and context specificity in the analysis are crucial in development studies, as demonstrated by studies focused on different results of PSNP-related research. This emphasizes, the necessity of considering various methodological variations, research biases, and timing when assessing the effectiveness of development initiatives. The study highlights, for example, that disparities in methodology, biases, and different contextual elements have led to conflicting outcomes among studies on the PSNP. Those who work in development studies and policymakers who work through these obstacles to create solutions that work well will find the findings helpful. Furthermore, the study's focus on PSNP's socio-economic effects is consistent with development studies' overarching objectives, which include supporting sustainable development and lowering inequality. Through an analysis of the program's influence on overarching development objectives, the study offers a framework for evaluating the more comprehensive socio-economic effects of other related programs in alternative settings. For instance, the research addresses how the PSNP has affected food security and the fight against poverty, providing insights that other areas dealing with comparable issues can use. Furthermore, the results of this study are supported by strong evidence because the study focused on peer-reviewed articles, books, conference papers, and donors report on the PSNP, which are highly referenced, and the study also used a systematic review procedure with meta-analysis. This method is crucial for development research because, to achieve long-term growth, using evidence to uniform policy decisions is necessary.

Keywords: food (in) security, methodological bias, critical literature review, PSNP, Ethiopia

CHAPTER ONE

1. INTRODUCTION AND RATIONALE OF THE STUDY

In Ethiopia, chronic food insecurity first surfaced as a major issue and development concern in the early 1970s and spread throughout the country in the decades that followed (Berlie, 2018, p 110). Emergency food aid was the main response strategy to the period's shocks with an annual range of 5 to 14 million people receiving it. For a long time, poverty and food insecurity have been a major issue in Ethiopia (Andersson et al., 2011, p 120). This trend has continued to this day due to natural and man-made factors. Productive Safety Net Program (PSNP) is a poverty reduction initiative in Ethiopia since 2005. It was first presented in 2005 by the Ethiopian government and other donors like the World Bank to address chronic food insecurity in rural areas on a long-term basis (Gazeaud & Stephane, 2023, p 269). The program's main goal is to increase the resilience of low-income households by lowering their susceptibility to different kinds of shocks (Abay et al., 2022, p 1).

The PSNP had two essential elements: Public Works (PWs) and direct assistance like cash transfers. One of the labor-intensive PSNP components, PW builds local infrastructures such as roads, conserves soil and water, and cultivates communal resources through terracing (Abay, et al, 2022, p 2). The goal is to give physically capable workers job opportunities. These households were chosen based on low standards (low land, and cattle holding for instance). Cash transfers, however, are intended for people who are too old or physically unable (disabled) to perform public works. Only a considerably smaller percentage of the recipients get hands-on assistance. These households lack a workforce and are poorer than those that receive PW employment. Cash payment is made in this instance without conditions. Community members vote on who ought to be included in the PSNP based on these predetermined criteria during the community meeting, which is the final process of selecting a qualified family for the PSNP (Berhane, et al, 2014, p 3). Moreover, the PSNP targets woredas or areas that have experienced drought and persistent food insecurity.

Most of the studies on PSNP contradict each other. Some of the authors contend that the program had little impact on poor people who are unable to escape from poverty, and thus its vicious circle remains the same. Others acknowledged the positive contribution of the program. However, in the middle of this, it is not known who is benefited from this program. Food insecurity and temporary food shortfalls are addressed by social protection programs such as PSNP. According to Abay, et al, (2022 pp. 1-2), there is insufficient proof that these interventions increase household resilience. It is unclear, though, if the program helps with long-term monitoring of household welfare dynamics and resilience. The PSNP and complementing programs that offer financial access, agricultural extension, income diversification, and other services can work together to achieve food security (Dessie, 2022, p 108). For example, the PSNP in Ethiopia is primarily being implemented in pastoral areas of semi-arid and desert lowlands that are severely drought, flood-prone, and lack basic infrastructure. However, the initiative's objective is to reduce food insecurity, particularly for those who require emergency food assistance, although community members are free to choose the worst instance of food insecurity based on local

standards. This method is not without risk though. This is so that some local interest groups can have an impact on the targeting group selection procedure. Even worse, prospective beneficiaries lack enough knowledge about their rights and the appeals processes (Sharp, et al, 2006, p 29). In this way, a subpar procedure for choosing which eligible households to target can reduce the program's effectiveness. Errors in inclusion-exclusion result from this.

According to this study, different variables are a contributing factor for the differences across studies. These are methodological factors, research bias and constraints, geographic bias, contextual and time-related elements, method of data collection as well as analysis. The meta-analysis high level of heterogeneity (I^2 = 99.9%) suggest that factors such as population characteristics, regional contexts and implementation methods significantly affect the PSNP's effectiveness. Nonetheless, the PSNP is still making progress towards its objective of reducing poverty and food insecurity. In contrast to the study's hypothesis, measurement variation in the research reviewed does not reveal any significant variation. A few studies found this to be a case (see 4.7) and cannot be a reason for variation across the studies.

Geographic bias may have been introduced by the fact that Anato, et al, (2022, pp 1-9) research was carried out in the Meket area, where severe food insecurity and dependence on food aid have been seen. This restriction has an impact on the applicability to other areas with different levels of socio-economic conditions (p 1). A major determinant in agrarian communities, differences in food insecurity by season may not have been captured by the period of data collection which was (September-October 2023). The same holds true in Toma, et al, (2023, pp 1-15), where a brief period may not adequately reflect seasonal differences in insecurity of food. In this sense, it is difficult to reach firm findings since the study lacks well-defined questions for research and of course hypothesis, which could influence the study's focus and direction (p 4). Moreover, Berhane, (2014, pp 1-26) only used one wave of data which could compromise the reliability of their findings about how social safety measures like PSNP affect the wellbeing of the children. The two major problems are the time interval between the data from the baseline and the results and the estimating methods depending on assumptions (p 3).

Though PSNP had a beneficial influence on children's meals, the study by Bahru, et al, (2020, pp 1-9) found insufficient data on the program's success in enhancing "household food security and nutrition of children". A few methodological and analytical difficulties exacerbate this problem. In terms of methodology, the study admits that bias may have existed because of mistakes when measuring food security, which might have affected the findings. The analysis is limited to specific period and cohort studies (p 7). Also, there is no effect of the PSNP on the dietary diversity of children in which PSNP beneficiaries have low dietary diversity (p 8). The problem with the study of Dejene & Cochrane, (2022, pp 157-175) is related to methodological shortcomings, this is specifically related to the absence of "baseline data" and the problems in interpreting and analyzing data. Since it lacks baseline or longitudinal data that are expected to be comparable it is difficult to compare the environment of the data collection period to other times (p 158). Due to the study's dependence on location, and lack of "baseline data", bias may be introduced into the analysis and interpretation of findings.

Toma, et al, (2023, pp 1-15) provided a thorough analysis of food insecurity in the South Ari woreda. Nonetheless, this study can be criticized in several ways. If a sample frame is not complete or current, relying on the strategy of systematic sampling after it has been prepared may create selection bias (p 8). With its high response rate, that is 98.6%, response bias may be present since the characteristics of respondents who preferred to participate may differ from those who did not. Additionally, health extension workers and diploma nurses have collected the data for this research. In this sense, for instance, if they have a pre-existing idea about food insecurity in the community, this could add interviewer bias (p 2). Belete's (2021, pp 681-712) analysis admits that taking part in the PW may result in less funding for children's needs with higher prevalences of child poverty (p 688). It is difficult to explain these results, though, and the study supposes that the PW's labor needs may have a role (p 700). Since the study does not take all these factors into consideration plus all the factors impacting the results, this suggests that there may be bias in how the results are interpreted.

Most of the PSNP-related research focuses on the various program measures or variables. For example, Wereta & Ahmed, (2024, pp 182-197); Kassa, (2018, pp 84-88); and Desalegn & Ali, (2018, pp 1-18) focuses on the negative and positive PSNPs impacts. They focused on the beneficial effects of the PSNP such as food security of households, growing crop yields, and benefits related to purchasing (Desalegn & Ali, 2018, pp 1-14) impacting the social, economic and environmental developments of beneficiaries in both negative and positive ways (Kassa, 2018, 84) impacts of the program and its function in combating chronic poverty and dangerous circumstances focusing on comprehensive social safety net programs like Iqub, Iddir, Zakat, and Community Based Health Insurance (CBHI) including PSNP (Wereta & Ahmed, 2024, p 182). Methodologically, Kassa included unpublished and published documents from 2013 up to 2018, and used narrative as a qualitative method (p 85); Wereta and Ahmed included the studies in the review from 2013-2024 (unpublished and published) using keywords like "social protection, rural farmer, smallholder farmer, constraints" (pp 184-185).

Following a thorough review of the literature, the studies reporting negative and positive outcomes of the program have been noted. That is why the focus of this study concentrates on the differences, that is why these studies are producing positive and negative results? Therefore, the aim of this study is beyond the benefits and drawbacks of the PSNP; but focusing on "why"?. In relation to the above studies, for example, this study had clear differences. As opposed to above mentioned three studies, this study reviewed studies related to PSNP that focus only on food (in) security. These studies focus on broad variables of social protection in Ethiopia (for example Wereta & Ahmed). In relation to the type of study, the focus of this review is published studies, which helps to reduce potential bias, decreased quality of methodology, and prejudice in finding as well. This review also includes the studies from 2010-2024 and followed different methodologies than the above studies. The study used a critical literature review with meta-analysis. Moreover, keywords are necessary for searching relevant literature that decides the focus of the study. The keyword of this study is specific, that is PSNP, food (in) security, effectiveness, and Ethiopia.

The major aim of this research is to determine the primary reason for the difference across studies. Along with methodological difference, research biases, time, contextual variation, and biases in data collection and analysis, this review found that significant gap was the absence of long-term analysis of PSNP effectiveness specifically regarding acquiring assets and ensuring food security over time. The generalization and applicability of many studies to larger contexts are limited by their emphasis on short term results or particular demographic groups. This study fills these gaps by performing thorough critical literature review with meta-analysis, which combines results from several research projects to offer more precise analysis of the PSNP's effectiveness.

This study helps to inform policymakers and the government about loopholes in the program and related challenges to food insecurity in the country. Moreover, it enables the decision-makers to evaluate the quality of evidence and suitability of the methodologies employed to examine the program effect. For example, the PSNP can be modified in accordance with methodologies identification of a particular prospect or contest. The next section of the review is divided into different sections: critical literature review and theories, methodology, presentation of the review and analysis, and finally discussion of meta-analysis result have been discussed along with concluding chapter. The sections below focused on the reason for the differences across the studies. To illustrate why the studies differ this involves, for example, examining the themes or patterns that lead the study to reach that conclusion.

1.1 Relevance and Justification of Ethiopia's PSNP

This literature-based study analyzes the reason for difference across studies focusing on the context of food (in) security that Ethiopia faced during the previous decades. It contributes to the effectiveness of the program in accomplishing its intended objective. The findings which provide light on the planning, administration, and execution of the PSNP will encourage the creation of evidence-based policies and well-informed choices. Additionally, by demonstrating the contribution of the program to overall development goals and reducing inequality, the study helps to quantify the program's larger socio-economic impact. People in Ethiopia, for example, who have experienced internal displacement, food shortages, and droughts that result in chronic food insecurity would benefit from this program. Thus, this study addressed the primary cause of variation amongst PSNP-related research, particularly concerning methodology, research bias, method of data collection and analysis as well as time related elements and identified potential remedies depending on the objectives.

1.2 Research questions

The main research question of the study is why do different studies on the PSNP generate different results?

Is this related to methodologies used in the studies or to other reasons, such as timing of the studies assumptions, and biases within the studies?

1.3 Research hypothesis

PSNP produced varying outcomes due to differences in the methodology time frame and emphasis on different measuring parameters.

1.4 Structure of the research

There are six chapters in this study. The introduction and rationale of the study are covered in the first chapter, including the research question, and hypothesis. Chapter two delves into the critical literature review and theories. In first section, critical literature review has been conducted based on the methodological differences, time related elements, research bias, and method of data collection and analysis. These variables have been reviewed and analyzed in a way that answers the research question. Moreover, in second section the way that methodology, bias in research shape research finding has been discussed to align with the research question as it is believed to influence the research's path and argument. The third chapter deals with a detailed description of the methodology of critical literature review including inclusion-exclusion criteria, that states how the studies are selected for this review. Limiters used during database search and the kind of literature, screening data, and risks and ethical challenges were part of this chapter. Regarding meta-analysis, every step followed have been discussed. This includes search strategy, inclusion-exclusion criteria, data extraction, effect size computation and aggregation, heterogeneity assessment and sensitivity analysis have been discussed. Chapter four includes a presentation of the overall review results and analysis, as per the variables chosen for the review, according to the procedure/criterion set. In chapter five, meta-analysis result has been discussed with necessary variables. Finally, chapter six is the concluding chapter of the overall study.

CHAPTER TWO

2. CRITICAL REVIEW OF THE LITERATURE AND THEORIES

2.1 Critical literature review

For this section 7 studies (different from chapter four and five) have been reviewed separately. The research methods used in the studies reviewed here in the critical literature review varies. It seems this affected applicability and consistency of the conclusion of the studies. Gebresellassie, (2020, pp 1-18), for example employed a multi-stage sampling methods to obtain primary information from the urban households in the city of Mekelle (p 6). This methodology guarantees a representative group of people, hence increasing the findings generalizability. The PSNP in Wuchale woreda on the other hand is examined in the study by Ayalew, (2021, pp 637-658) which uses mixed methods study design that combines both quantitative and qualitative methods (p 642). A more detailed insight of the program's impacts on the incomes and food security in the household is made possible by this design. Moreover, the study of Rahmato, et al, (2013, pp 1-578) contains both quantitative and qualitative techniques of gathering of data, demonstrating the use of mixed methodologies (p 177). This method enables a more comprehensive data set and increases analytical capacity. Since the methodological choice dictates the breath and depth of research, it has meaningful impact on the study's conclusion.

The way that research biases are recognized and handled varies throughout studies which impacts the reliability of their conclusion. To reduce bias when evaluating consequences of the effect using "observational datasets" Gebresellassie used "Propensity Score Matching (PSM)" method (p 1). More clear assessment of the PSNP impact is made possible by this technique which is especially helpful in situation when participation in the program is not chosen at random. However, by using a combination of non-probability and probability sampling techniques the study by Ayalew recognizes possible bias (p 642). In addition to guaranteeing representative group of people (sample). This two-way strategy enables the incorporation of particular insights from key informants. Nevertheless, using self-reported information from interview and surveys could lead to response bias since respondents might give answers that are socially acceptable. To mitigate research bias, Tesfaye & Egata's (2022) study (pp 1-12) uses preferences that were discovered, which reduces the judgement of the researcher in identifying which parts of demands from households are a good indicator of welfare (p 11). By using this approach, communities may share their goal and reduce the possibility of prejudice resulting from standards that are enforced from outside.

The result of the studies reviewed are significantly shaped by time related factors. For instance, data collection for the study of Adimassu and Kessler, (2015, pp 54-62) takes place at various points through several years (p 57). In this regard, the researchers can monitor variations over time due to long term viewpoint, which sheds light on how policies for food security have changed and what affects they have had. In the study by Ayalew (2021, pp 637-658) the results are given in the context of 2020 when the study's data gathering took place (p 645). This time frame is necessary because it captures the policy conditions and socio-economic circumstances of a time

which could have affected the PSNP effectiveness (642). But using cross-sectional design makes this study difficult to evaluate changes over time, which may have an impact on how PSNP's long-term effects are interpreted. The same is true for the research that only record data at one moment in time like Tesfaye & Egata (2022, pp 1-12) which restricts the capacity to prove connection. The more important here is the date of data collection which may align with seasonal trends that impact food security. The study of Derso, et al, (2021, pp 1-17) for example, was carried out between June and July 2019 and offers indication of food security over a particular time frame (p 1). Although this time-based emphasis is useful for recognizing seasonal differences, it might not adequately reflect trends that occur throughout the year.

The varied approach that the researchers have to data gathering and analysis have an impact on the reliability of their conclusion. The Gebreselassie (2020 pp 1-18) study offers important insights in the factors of food poverty in Ethiopia by combining good quality data using strong analytical methodology (p 1). Critical analysis of the variations affecting PSNP graduation is made possible by the application of "descriptive statistics and logistic regression analysis" (pp 11-12). The study by Ayalew (2021, pp 637-658) on the other hand, uses secondary materials like journal articles and books in addition to primary instruments of data collection like interviews and surveys (p 643). This method guarantees the research offers a detailed analysis of variables affecting PSNP graduation. A mixed method is used in Rahmato, et al, (2013, pp 1-578), which combines both quantitative and qualitative methods. This method enables a larger data pool and more analytical capability.

To ensure that the results are in line with the study aims, the goals of these research serve as a guide for the data gathering and analysis procedure. For example, Adimassu & Kessler's 2015, pp 54-62 study looks at how PSNP affect Sustainable Land Management (SLM) for farmers due to its connection with food security and PSNP particularly, considering both possible advantages and disadvantages (pp 57-58). This goal directs variable selection for the analysis, and this shapes the studies emphasis on SLM practices such as managing fertility of soil and preventing soil erosion (pp 60-61). As a result, the study conclusions are closely related to its goal and shed light on how PSNP involvement affects SLM assets (p 61). Similarly, Gebreselassie's study examined how "Urban Productive Safety Net Program (UPSNP)" affects insecurity of food for the residents in Mekelle (p 3). The way factors selected are directly connected to food security like average yearly income and general expenditure of consumption, is guided by the goal of this study. Children from the households with included and not included as PSNP beneficiaries will have their stunting prevalences compared in Tesfaye & Egata's (2022, pp 1-12) study. Supporting data for this goal indicates that distribution of aid benefit households with reduced prospects for external wage earnings and thus larger families have a greater chance of being included in the PSNP (p 11). With an emphasis on the effects of weather and climate shocks, safety net, and socio-economic factors, Dasgupta & Robinson, (2021, pp 66-82) study goal was to examine factors that contributed to insecurity of food in Ethiopia (p 66). The focus is essential since it directs both the analytical framework and variable selection. Different aspects of food insecurity are examined, including limited dietary diversity and depending on less preferred foods. This gives a more detailed view of the various cause that led to food insecurity.

2.2 Theoretical framework of the study

Hammersley & Gomm, (1997, pp 1-9) identified different kinds of errors that shape research findings including their philosophical underpinnings, while reserving the term bias as systematic errors that are accountable to varied research findings. Having multiple meanings, the word "bias" itself remained unclear. From their work, one that draws attention is the term bias has more than one meaning. For this, they listed various uncertainties that surrounded the research, including those outside the research procedure, for example, political attitude (p 2). They made the case that some of these biases resulted from the use of insufficient "foundationalist epistemology". By maintaining extreme alternatives to the viewpoint theory and relativism as epistemological frameworks that do not offer an applicable alternative, they come up with "non-foundationalist realism" as workable and crucial to understand so that it is proposed theoretical framework for bias in this regard. This is due to the shortcomings of "radical alternatives" as it is crucial to consider the problems revolve around objectivity, truth, and bias as they apply to social science. In this regard, they believe this can shape both qualitative and quantitative researchers and the effect has not completely disappeared despite direct criticism.

In research irrespective of sample size, a biased study methodology will consistently falsify the sample or population. Among the bias, for instance, the sample being surveyed like the rest of the techniques to gather data from the larger areas, where the population is distributed to many geographic settings may have a gap in coverage since the sample's source does not include all members of the target being selected (Adams, et al, 2007, p 98). That is why choosing a sample that perfectly reflects the population is necessary. When talking about sampling bias, Bhattacharjee, (2012, p 81) gave an example of sampling bias and how it impacts the findings and takes to the misleading generalization. People who have changed their phones, and not answering phone calls, due to various circumstances (for instance being at work) can be methodically excluded from telephone polls that are done by calling randomly on available numbers. The same example and explanation have been used in Nayak & Singh, (2021, p 170). This kind of sampling resulted in selecting a sample from the incorrect population. These biases impair the generalizability claims for the biased conclusion from the sample and render the population expected to be included not well-represented by the responder sample.

Burton-Jones (2009, p 445) believes that methodological or technical bias influences the study so in this way, they construct a measurement that can result in incorrect results. Even though there is a lot of research work in the literature related to methodology on specific components of method bias, (including self-reported and common method prejudice) the definition of methodological bias by itself remains unclear. That is why an all-encompassing strategy for addressing this is lacking. Diefenbach, (2009 p 875) addressed the methodological issues that can arise during research. The author identified the concerning areas that can distort the whole research process including the findings. For example, when these problems start and how. These are: before or during the overall research process, the procedure of data collection, interpretation, and validation of the data, the data and finding's external validity, and the finding's relationship to "social science

and social practice". The author magnified the great need for logical criticism and a deeper understanding of methodology, especially concerning the potential subjectivity bias, generalizing the results and the effects of popular thinking and prevalent ideologies.

Eisenhardt, (1989), as stated in Kalu, et al, (2017, p 47) argued that having a different kind of data collection instruments is necessary to reduce bias, particularly in the instance of qualitative research to produce a balanced finding in the study. I found the work of Bernard (2014, p 6), interesting concerning methodological bias on the systematically produced research topic entitled "Things I have learned about meta-analysis since 1990". It contains a lot of stories about systematic review/meta-analysis, from which the author learned about systematic review for decades. The author revealed that a well-crafted systematic review ought to have a clear and specific problem description, and the necessary inclusion/exclusion criteria will help the reader to determine whether the subsequent procedures are likely to produce a biased conclusion. It is a well-known fact among researchers that no methodology in research is an exception to bias; nonetheless, biases originate in practice rather than conception (p 5). However, any systematic review should aim to reduce these biases from every stage in the systematic review process, including selecting (for example searching literature) and assessing a given research topic.

There are many sources of possible bias that affect research findings. Among many others, for instance, the diversity of the study participants, including the sample selection procedure might provide various sources of bias in each research topic. Moreover, the vast range of psychological, emotional, and physical characteristics can impact research settings and participants differently. These diverse attributes are expected to have an immediate impact on the research findings (Marczyk, et al, 2005, p 68). Conversely, Common Method Bias (CMB), happens when the same methodology is used to gather the necessary variables employed to measure the study (Podsakoff & Organ, 1986, cited in Memon, et. al, 2023, p 9). For instance, many dimensions of these variables have been measured using the same methodology and the correlation between these variables can be biased. The prevalence of these kinds of biases frequently results in inaccurate conclusions, which will negatively affect the advancement of theory and real-world practices.

Besides all the advantages, survey research is said to be subject to bias which makes the conclusion drawn from it questionable. "Common technique bias, non-response bias, social desirability bias, sampling bias, and recollection bias" are five examples of survey bias that are discussed in Nayak & Singh, (2021, p 169). In the case of non-response bias, for instance, if the respondents expected to answer the questions that are not completed, who knows whether those not responding are refused due to a systematic reason or any other reason? This could also affect the validity of the study findings. According to Nayak & Singh, the respondents being annoyed in a particular case are more likely to reply to questions than happy respondents because they would like to speak more about the experience that made them dissatisfied. A lot of respondents may tend to shy away from opposed remarks or negative opinions and comments about their affiliation (their families, workplace, colleagues, friends, and of course themselves). This affects the reliability of the survey data collected.

For Olteanu, et al, (2019, p 6) population bias is a difference between the audience targeted and the user population reflected in platforms that are systemic in terms of demographics or other user attributes. When we talk about the implications, biases related to the research population have the potential to undermine both external and internal validity of the research. This is by compromising the representativeness of the sample. This will add complexity to the research. Another kind of bias which is stated by Oltenau, et al, (2019, p 9) is "temporal biases". They define it as systematic misrepresentation over time in user groups or behaviors and the implication of this distortion is also followed in their discussion. This kind of bias (bias related to time) is associated with this study (see chapter four). According to the authors, data gathered over time may vary depending on several factors such as platform usage capabilities, user demographics, and method of usage. Furthermore, throughout time, these variations may show a range of patterns that include those pertaining to both consistency and level of detail. This also has an impact on the researcher's external and internal validity. Use patterns may systematically vary due to seasonal and periodic occurrences (p 9). In general, it is necessary for the researchers to identify and quantify the primary causes of bias of the method in their study Podsakoff, (2003, p 894). This is a significant drawback since it can be challenging to separate the primary cause of technique bias in a particular scenario of research.

CHAPTER THREE

3. METHODOLOGY

The method used for this study is a critical literature review with meta-analysis using semi-systematic review techniques to select the literatures. This is without necessarily following all the procedure precisely because of the nature of different studies which involves time-consuming rules and standards to be followed. To comprehend common practices and potential gaps in different opinions about the program's core, a systematic review is well suited to assess the methodology employed in various studies within PSNP and answer effectiveness-related research questions.

3.1 Critical literature review

3.1.1 Inclusion-exclusion criteria

This study has inclusion and exclusion criteria to guarantee the study procedure is open and compliant with research questions. The basic eligibility criteria for selecting the review articles were peer-reviewed publication, impact and effectiveness related literatures (see chapter four), date range, study type (qualitative-quantitative), methodology, and geographic location. The addition of fundamental criteria for inclusion and exclusion is displayed in Tables 1 and 2 below.

Table 1: Inclusion criteria

No	Inclusion criteria	Explanations of literature being selected
1	Relevance to the PSNP	The research concentrated on PSNP, particularly food security /insecurity, and related variables. Additionally, they assess if the PSNP intervention has had a beneficial or negative impact on Ethiopia's food security or poverty reduction.
2	Language	The literatures used in this study were written and published in English.
3	Type of publication	Peer-reviewed journal articles were employed in this review. Moreover, reports, books, working paper, and policy briefs were used to triangulate analysis in addition to peer reviewed articles.
4	Year of publication	The study included research works released from 2010 to 2024. Also, the most recent relevant studies were presented.
5	Type of Study	The study used a variety of study designs such as (but not limited to) impact evaluation, comparative studies, longitudinal studies, observational studies, and cross-sectional surveys to give detailed data on the PSNP.
6	Geographic location (focus)	PSNP is a program unique to a given nation. Therefore, research that particularly looks at PSNP in Ethiopia was included in the study. However, this is regardless of where and by whom studies are published.

7	Target population	The study's target population was the studies that dealt with the PSNP program's target group. These include smallholder farmers, pastoralists, the poorest people in the community, and households in rural and urban areas.

Source: the researcher, 2024

Table 2: Exclusion Criteria

Exclusion criteria are the reverse of inclusion criteria. Some of them nevertheless require more clarification.

No	Exclusion criteria	Explanation of literature not being selected
1	Redundancy	To assure originality and prevent redundancy, the researcher omitted article (s) that are identical to the PSNP evaluation. However, if the studies used different methodologies and were conducted in varying regions of the country are considered.
2	Not having access to the entire text	The text or source that is unavailable or difficult to obtain is considered to affect the review and was not selected.
3	Unimportant emphasis	Research on the broad safety net without mentioning the PSNP in Ethiopia was not accepted.
4	Research design constraints	This review did not include studies that reduce the validity of the findings due to limited sample sizes.

Source: the researcher, 2024

3.1.2 Limiters and type of literature

An extensive search of the literature was performed. The time factor and focus of the study were considered when using the limiters or filters for the research. This made it task a bit easier to concentrate on the studies that fit specific pre-established requirements. They were implemented transparently to guarantee the validity of the research procedure. To do so, interdisciplinary databases were selected. The focus was the database's accessibility based on inclusion-exclusion criteria.

Peer-reviewed articles that fulfill inclusion-exclusion criteria were imported to RefWorks, basically from Web of Science, Scopus, and Google Scholar. For the record content, the author, title, source, and abstract were selected for the preliminary selection. Also, to avoid repetition, import options like "import tags from the database, search for full text, and ignore duplicates" have been selected for each database before completing import to RefWorks. The limiters like "Or" and "And" were used to extend and reduce the number of selected pieces of literature. The keywords were used to search relevant studies for critical literature review. For example, PSNP and food (in) security were used as the focus of this study. For books, impact and effectiveness

related other literatures, this step has not been followed and downloaded directly from published internet sources.

3.1.3 Screening data

To reduce bias screening was carried out with supervisor guidance and initial technical support from the ISS librarian. Based on the criterion set, preliminary screening was conducted by reading the abstracts and keywords, methodology, and finding after importing articles to RefWorks. Then the studies that fulfilled inclusion-exclusion criteria were recorded. During the screening, the focus was on highly cited papers. One of the advantages of using "Erasmus University Library Databases" during screening was some indicators display "highly cited" peer-reviewed articles in databases. Moreover, the variable associated with the study's title, keywords, and research question was the main emphasis at the screening stage. Two rounds of screening were conducted to check the quality of the reviewed paper, excluding the preliminary review before importing it to RefWorks. The most recent iteration of the "PRISMA 2020 flow diagram for the new systematic review" has been applied to the article selection procedure. The linked flow chart below shows the details from identification to inclusion.

Figure 1: A flow diagram for PRISMA 2020 that shows how studies were chosen
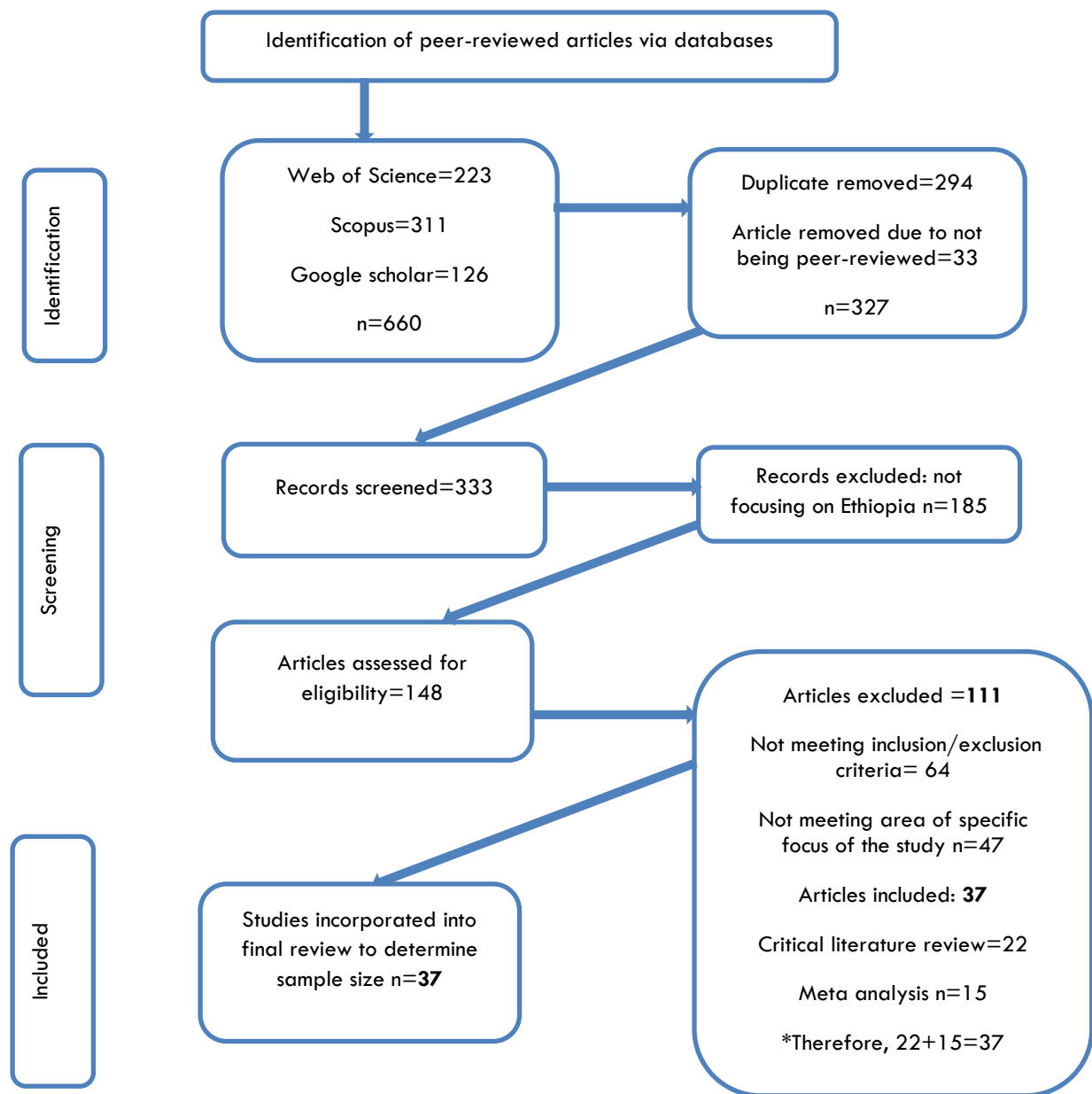
Source: adapted from (Page, et al, 2021, p 6)

3.1.4 Method of data presentation and analysis

As stated above, 22 studies were chosen for critical literature review once the evaluation procedure was completed. Among 22 studies, 7 of them have been used in the literature review in the 2.1 critical literature review session above. The variables reviewed are like those of chapter four: methodology, research bias, time-related elements, data interpretation and analysis. Both quantitative and qualitative studies were included. Based on the research question, specific variables to be analyzed were determined for each of the studies discussed in the next sessions. For example, as shown in Table 3 below, methodology (the method used, including instruments), sampling techniques and sample size, food security measurement used, findings, and study gap were registered.

Data presentation and analysis were approached systematically. As shown in Table 3 below, elements of any study, that is, specific areas and variables to be reviewed are selected. For instance, in this case, the aim of the research and research question, comparative analysis across studies, methodological factor influencing, contextual or time-related elements, data presentation and analysis, and research constraints or prejudices. However, it does not mean that these are the only areas that should be reviewed, that is, time related factors have been taken into consideration. In general, the review of all these variables was aimed at answering the primary analysis of this research, that is, why do different studies on the PSNP generate different results? The table 3 below shows the critical literature review process in detail.

Table 3: Approaches/criterion followed to conduct critical literature review

No	Areas selected for the review	What has been reviewed?	How?	Variables addressed
1	Purpose of study and research questions	The goals and inquiries each study aims to answer. *For instance,* what aspect of the PSNP is this study focusing?	Examine how the focus or scope of each study produced different results. Determine whether these variations contribute to explanations of differences in study outcomes.	Focus, aim, and scope
2	Comparative analysis	Compare how reviewed studies respond to related research topics or PSNP components. This includes, for instance, identifying trends or themes in the way research findings are reached.	Combine these comparisons to show the reason for the differences in outcomes.	The variables addressed in each study
3	Methodological factor influencing	The ways that research findings are influenced by study design and methods employed.	In what ways did the methodologies affect each study's findings? Does this result in varying judgments regarding the effectiveness of the PSNP? How?	Longitudinal panel data and mixed method; stratified and cross-sectional sampling design; ethnographic, qualitative, and longitudinal methodologies
4	Contextual or time-related elements	Examine the time, place, and external conditions that influenced the study's surroundings.	Examine how these contextual elements could impact each study's PSNP results.	Geographic, chronological, socio-economic, and external situation

5	Data presentation and analysis	How the data collected by the study is interpreted and analyzed? *For instance,* this entails looking at the coding procedures, themes found, and the story developed considering the results.	Examine how different research projects may use analytical frameworks to interpret comparable data in diverse ways	Qualitative, quantitative, and mixed approach
6	Research constraints and prejudices	Examine the restrictions/limitations and any prejudices that the study author (s) have recognized (researcher (s) own words) *For example,* this covers any prejudices present in the gathering, analysis, or viewpoints of the researcher (s).	How these constraints and biases could lead to disparate results	Data collection procedure, period (season) of data collection, researcher viewpoint and interpretation, findings generalizability, beneficiary targeting bias, non-response bias, and measurement inaccuracies

Source: The study variables being reviewed, inclusion/exclusion criteria, and the researcher, 2024

3.2 Meta analysis

Meta-analysis has also been conducted on studies other than those reviewed in chapters 2 and 3. As statistical technique, meta-analysis synthesizes results from several research that address a similar research question. It improves the statistical power to identify an effect by combining data from several studies, which expands the total sample size. It gives a more accurate assessment of the effect size and enables researchers to spot trends, disagreement sources, or moderators' effects on the result. Particularly it is helpful in domains such as psychology, medicine, and social sciences, meta-analysis facilitates the synthesis of results from diverse research endeavors to support evidence-based decision-making.

The DerSimonian and Laird (DL) method and the Mantel-Haenszel (MH) method are two distinct ways to combine data from several studies in meta-analyses. With its fixed-effect model and assumption of a uniform effect size for all studies, the MH method produces an accurate pooled estimate that is particularly helpful when there are low event rates. By incorporating between-study heterogeneity, the DL method is a random-effects model that considers variability between studies into account and provides a more conservative estimate. DL is more appropriate for heterogeneous effects, whereas MH is preferred when study effects are homogeneous. The choice between these approaches is contingent upon the level of heterogeneity noted in the meta-analysis. Mantel-Haenszel (MH) method is applied in this study.

3.2.1 Search strategy

A comprehensive search of literature was conducted to identify studies assessing the effect of the PSNP on various outcome measures. The search included electronic databases such as Google Scholar, Cochrane Library, Web of Science, EMBASE, Medline/PubMed, and Scopus. The search terms used included combinations of keywords and phrases related to PSNP and relevant

outcomes, such as "PSNP participant and non-participant," "beneficiary and non-beneficiary," "Household Dietary Diversity Score (HDDS)," "food security," "poverty headcount," and "resilience." These are necessary variables to measure PSNP. Unlike critical literature review, no restrictions were applied on publication date or language to ensure a broad inclusion of relevant studies. However, 15 studies selected for final analysis ranges between 2014-2024, being published in English. The search results were imported into EndNote X9 for efficient screening and management.

3.2.2 Inclusion-exclusion criteria

The studies were included if they involved PSNP recipient and non-recipients in Ethiopia, assessed participation in the PSNP program, and provided comparisons between PSNP beneficiaries and non-beneficiaries or before and after comparisons within the same group. Eligible studies needed to report quantitative outcomes related to Household Dietary Diversity Score (HDDS), food security, poverty headcount, resilience, women's BMI, or height-for-age z-scores (HAZ). Quantitative study designs, such as cross-sectional, cohort, and pre-post studies, were included if they supplied adequate data to calculate the effect size. Studies were excluded if they lacked enough information to calculate the effect size computation, because this did not offer a clear comparison between PSNP participants and non-participants, or were duplicates or secondary analyses without original data.

3.2.3 Data extraction

Data from the selected studies were extracted on sample size, region, comparison group, and outcome variables, number of PSNP recipients and non-recipients, and effect sizes. These variables were essential for the meta-analysis to evaluate the impact of PSNP on various outcomes across different regions and population groups. Effect sizes were computed or directly extracted from the studies when provided.

3.2.4 Effect size computation and aggregation

The meta-analysis used a random-effects model to account for the variability across studies. Effect sizes (e.g., mean differences, standardized mean differences, or odds ratios) were computed for each study outcome to allow consistent comparison across studies. For outcomes like HDDS, food security, and BMI, standardized mean differences were calculated, while for binary outcomes like poverty headcount and program participation, odds ratios were used.

3.2.5 Heterogeneity assessment

To assess heterogeneity among studies, Cochran's Q test and the I^2 statistic were calculated. Significant heterogeneity prompted further analyses of subgroup to investigate sources of variation by factors like region, population characteristics, and study design.

3.2.6 Sensitivity analysis

A sensitivity analysis was done by excluding studies one at a time to evaluate the consistency of the results. This helped to determine whether the overall effect of PSNP was strong or driven by a particular subset of studies.

3.3 Risks and ethical challenges

This is a literature-based study. Primary data collection is not being done. Thus, it is a low-risk study compared with the research that includes primary data collection. However, as a desk researcher, assessing the credibility and accuracy of sources is difficult and takes time. Screening and selecting literature were time time-consuming processes. For instance, reading the details of individual studies to make them compatible with inclusion/exclusion criteria requires time, commitment, and an ethical research approach. Moreover, fair use of literature can be difficult to define and depends on the situation. This makes the applicability of all planned methodologies difficult. Researchers with positive PSNP results have a higher chance of publication than those with a negative impact on the Ethiopian literature. This is because PSNP is an initiative introduced by the Ethiopian government in 2005. By considering this, the focus was on the interdisciplinary databases, and peer-reviewed highly cited articles in Erasmus University Databases.

CHAPTER FOUR

4. PRESENTATION OF THE REVIEW AND ANALYSIS

4.1 General overview of the critical literature review

In the first part of this chapter, the overview of the results of reviewed studies from diverging findings were presented after filling in every detail in the table. As indicated below, the studies on PSNP that highlight its effect on food (in) security and related variables are presented. While some research reveals encouraging outcomes, others highlight shortcomings and negative impacts. Here is the summary of Table 3 critical literature review: the studies in this section state a thorough critical literature review that focuses on the differences across the studies while examining the effectiveness of Ethiopia's PSNP concerning food (in) security and nutritional variables in several geographic areas. The review complies with findings from multiple research projects employing various approaches including interviews, household surveys, and panel data analysis. It draws attention to the varying results emphasizing that although some research shows immediate nutritional gains and increased food security, others emphasize continuing problems such as childhood stunting, constrained asset growth, and inadequate long-term effectiveness in reducing poverty.

It has been stated that the PSNP, especially after COVID-19 has positive short-term effects on child nutrition and dietary diversity (the detail is discussed in this chapter below). Nevertheless, certain obstacles persist including the incapacity to diminish the broad dynamics of poverty and guarantee sustenance for every recipient, particularly following program completion. It is emphasized that several significant factors including insufficient funding tactics, and the complex relationship with local food security dynamics. Furthermore, food availability and pricing have been impacted by the switch from food aid to food transfer under the PSNP with varying results for food security. Significant gaps in the literature are also identified in the table. Long-term assessments of the PSNP's effects are scarce in much research, especially regarding the acquisition of assets and ongoing food security.

Table 4: Overview of some critical literature review

Journal name	Author(s)	Year	Title (as it stands)	Methodology		Food security measurement	Findings	Study gap
				Method/instrum.	Sample/size			
Frontiers in the sustainable food system	Engidaw, et al	2023	"Impact of the PSNP on the minimum acceptable diet in the rural community of South Gondar Zone, NW Ethiopia"	HH survey, questionnaire, interview	442-multi-stage	DD & meal frequency	Two-thirds of the children and newborns from PSNP users hhs possess a low threshold tolerable diet.	The study cannot prove a cause-and-effect relationship between an infant's minimum allowable diet and PSNP. Nothing is known about whether PSNP is improving newborns' eating habits.
Food policy	Sebates Wheeler & Devereux	2010	"Cash transfer and high food prices: explaining outcomes on Ethiopia's PSNP"	Two wave panel survey 2006vs 2008	960-multi-stage, stratified random	Not available	HHs who received food assistance had more food security than those who received cash	To what extent the PSNP shielded beneficiaries from growing food costs is not evaluated in this study
Sustainability	Azadi, et al	2017	"Targeting international food aid programs: the case of PSNP in Tigray, Ethiopia"	Mixed, hh survey and interview	479-structured survey	Not available	Gender disparity in access to food assistance was a significant factor	The only data used in this study is a survey of rural hhs. It does not consider qualitative information from beneficiaries and offices
Journal of modern African studies	Lavers	2013	"Food security and social protection in highland Ethiopia: linking the PSNP to land question"	Case-based approach, semi-structured interviews	Purposive	Not available	The PSNPs' chances of achieving food security are slim	Neglected to address underlying reasons for food scarcity considering the agricultural system constraints and lack of available land
Annals of Global Health	Mccann, et al	2023	"COVID-19 disruptions of food systems and nutrition service in Ethiopia: evidence of the impact & policy responses"	Review of literature, KII	8 KII-snowball	DD	As PSNP expanded, the disruption caused by COVID decreased over time	Insufficient evidence to ascertain the enduring consequence of COVID and the food chain & nutrition of mothers & children
Economic development and cultural change	Abay, et al	2023	"COVID-19 and food security in Ethiopia: do social protection programs protect?"	Household survey, interview	2,626-random	Self-reported indicator (food gap)	Relatively speaking PSNP participants experience less decline following COVID 19	It is challenging to assess the impacts of a pandemic on food security in hhs & effectiveness of PSNP in reducing such effects.
American Journal of Agricultural Economics	Gazeaud & Stephane	2023	"Productive workforce? Evidence from Ethiopia's PSNP"	"Satellite-based indicator of agricultural productivity", Survey 2013 & 2015	Highland vs Lowland woreda's	difference-in-difference estimate, probability weighting method	Limited shifts in food security and agricultural productivity are linked to PSNP	Although the beneficial benefits of PSNP transfers on food security have been thoroughly studied, nothing is known about the impact of PSNP infrastructure

Journal name	Author(s)	Year	Title (as it stands)	Methodology		Food security measurement	Findings	Study gap
				Method/instrum.	Sample/size			
Journal of Modern African Studies	Bishop & Hilhorst	2010	"From food aid to food security: the case of safety net policy in Ethiopia"	Ethnographic research, participant observation, FGDs	Random (-)	Wealth Group Criteria, Community Food Security task force	The PSNP does not include the poor	The study does not evaluate PSNP's long-term effectiveness; it just looks early functioning of the program with an emphasis on recipient selection
Development Policy Review	Sabates - Wheeler, et al	2019	"Graduation after 10 years of Ethiopia's PSNP: surviving but not thriving"	Panel hh survey data (2006-2014), longitudinal data, FGDs	3,688-stratified, random	Graduation Prediction System (GPS)	While the PSNP has achieved considerable success, it was unable to provide food security for graduates	While food security has improved, PSNP has not been able to lift hh out of poverty, an in-depth analysis of these factors is absent from this study
World Development	Scognamillo, et al	2024	"One for all and all for one: increasing the adaptive capacity of hhs and communities through a public Work program"	HH panel survey data (2011/12, 2013/14, and 2015/16)	3,639	Living standard measurement, WB & CSA of Ethiopia	There is a decreased likelihood of food insecurity and drought-related losses among PSNP beneficiaries	There is insufficient empirical data in the study to support the positive effects of public infrastructure created by PSNP-PWs
Social Science & Medicine	Morrow, et al	2017	"I started working because I was hungry" the consequence of food insecurity for children's well-being in rural Ethiopia	"Qualitative longitudinal research, data for 2007, 2008, 2011 & 2014", semi-structured interview, FGDs	60-purposive	DD	Food insecurity continues to be a significant factor influencing several issues for the poorest rural families using PSNP	The effectiveness of the PSNP in enhancing food security & its long-term effect on children's well-being is not particularly addressed
World development	Sabates - Wheeler, et al	2013	"Implementing social protection in agro-pastoralists and pastoralists areas: how local distribution structures moderate PSNP outcomes in Ethiopia"	Qualitative and quantitative, hh survey	1,607-random	Not available	The Food Security Task Force and other informal authority structures, as well as sharing practices, are essential to the PSNPs effectiveness	The long-term effect of the initiative on pastoralist's ability to develop resilience and eventually stop receiving outside assistance is not examined
Journal of African economies	Hoddinott, et al	2012	"The impact of Ethiopia's PSNP and related transfers on agricultural productivity"	Ethiopian Food Security Survey (EFSS) 2006, 2008 & 2010	3,688-two-stage clustered, random	PSM	Investment and fertilizer use both improved because of PSNP payment. But participation on its own has no impact	The research focuses mostly on PSNPS impact on the productivity of agriculture rather than examining the long-term effects on food insecurity

Journal name	Author(s)	Year	Title (as it stands)	Methodology		Food security measurement	Findings	Study gap
				Method/instrum.	Sample/size			
Nutrients	Potts, et al	2019	"Animal source food consumption in young children from four regions of Ethiopia: association with religion, livelihood and participation in the PSNP"	Cross-sectional survey, questionnaire	531-multi-stage probability	Minimum DD	PSNP improves children's nutritional diversification and boosts their intake of food derived from animals	The absence of a thorough assessment of food security & socioeconomic level could have led to more sophisticated knowledge of variables impacting children's consumption
Agriculture and food security	Welteji, et al	2017	"The contribution of the PSNP to food security of the rural households in the case of Bale zone, SE Ethiopia"	HH survey, KII, observation & FGDs	384-simple random, lottery	Not available	Benefits such as asset accumulation, local community development, and consumption smoothing were all aided by PSNP	It ignores graduation and sustainability in favor of immediate gains. Also, the structures of the PSNP are not being monitored or evaluated which causes low beneficiary knowledge

Source: the researcher, 2024

4.2 The study's objective and research questions

Abay, et al, 2023 and McCann, 2023 focus on the function of PSNP during the COVID-19 outbreak. The PSNP's effectiveness in decreasing food insecurity and advancing mother and child nutrition in the face of pandemic-related conditions is examined by Abay, et al, (2023, pp 375-384). Similarly, McCann (2023, p 9) emphasizes the PSNP's contribution to lowering food insecurity during the pandemic. The program's immediate crisis protection benefit is highlighted in this research, it might not be as clear in studies that concentrate on long-term effects.

Significant differences in marital status and gender were found in the analysis of how socioeconomic characteristics affect aid allocation within PSNP by Azadi, et al (2017, p 1). Studies that evaluate the program's equity and inclusion focus on targeted techniques rather than its wider economic effects or development of the infrastructures. The PSNP's effect on agricultural output is examined in Gazeaud and Stephane, 2023 and Hoddinot, et al, 2012. While Hoddinot, et al, (2012, pp 761-762) evaluate the cumulative effects of PSNP and other initiatives on agricultural outputs and investments, Gazeaud and Stephane, (2023, p 270) examine both direct and indirect implications of infrastructure developments on productivity. Unlike studies concentrating on immediate food security effects, these studies showed the program's capacity to raise agricultural output.

Sabates-Wheeler, et al, (2013, p 2) concentrate on the applications of PSNP in agropastoral and pastoral areas, studying how local structures impact program results. Studies that focus on agrarian areas address the region's difficulties, such as informal authority systems and techniques for resource sharing, which are highlighted in this study. The challenges in achieving sustained completion of the PSNP are studied by Sabates-Wheeler, et al, 2021, and Welteji, et al, 2017. They draw attention to the problems that hinder continued poverty alleviation such as low transfer values and early graduation (pp 1-2 and 8-9) respectively. These results can be compared to research emphasizing the need for a comprehensive strategy to address both short and long-term problems in food security improvements.

Differences among the research questions and objectives cause diversity in study results. This contradiction suggests that PSNP effectiveness varies depending on the environment, local implementation techniques, socio-demographic characteristics, and even outside shocks. This implies that the diversified nature of the PSNP result could not benefit from a "one-size-fits-all" strategy. Adaptive techniques that take local settings and problems into account are required instead. From this point, we can argue that, even while the PSNP shows significant results, there is always a need for ongoing assessment due to its limits. This means, for instance, for someone who wants to effectively serve the needs of PSNP beneficiaries, there should be a concentration on improving program flexibility, focusing techniques, and integration of supplementary services. This strategy can guarantee a long-term poverty reduction and help the PSNP to reach its full potential.

4.3 Comparative analysis across studies

Comparison of the studies has been done in this section with the goal of finding themes or patterns in the way that studies come to their conclusion. This is ought to allow for the synthesis of comparisons to show why findings differ. Thus, the focus remains on the differences across the studies.

The PSNP's contribution to improving beneficiaries' nutritional and food security needs is the center of most studies reviewed. According to Abay, et al, (2023, pp 373-402) PSNP membership considerably reduced food insecurity compared to non-beneficiaries, highlighting the preventive role during the COVID crisis (p 373). The detail of this is discussed below as McCann et al, (2023, pp 1-16) focused on the same role which is more or less similar with Abay, et al. Engidaw, et al, (2023, pp 1-9) evaluate the effects of PSNP on newborn's "Minimum Acceptable Diet (MAD)" and discover a greater percentage of infants obtaining MAD reside in PSNP woredas (P 1). When we consider other factors, this study showed that being a beneficiary of a PSNP household is not directly related with MAD (P 6). Rather MAD was significantly predicted by variables like father's education attainment, children's age, and marital status. For example, compared to married women, babies of unmarried women have a 3.98-fold higher risk of receiving MAD (P 6). Furthermore, compared to babies aged six to eleven months, those aged twelve to twenty-three months had a 2.82-fold higher chance of receiving MAD (P 7). As evidence of the impact of socio-economic position on DD and meal frequency, the research also found that newborns from richer households had a lower likelihood of receiving inadequate MAD intake. Here the difference in study emphasis, methodology, and demographic circumstances can be a cause for the variation in study results. For example, the focus of Engdaw, et al, is on newborn nutrition, whereas Abay, et al, concentrate on the COVID effects, resulting in different findings about the success of PSNP.

The difference between PSNP's stated goals and its actual implementation is examined by Bishop & Hilhorst, (2010, pp 181-202) who draw attention to local governments' use of the program for resettlement plans (p 181). By keeping the poorest sections of societies from losing their possession and promoting economic endeavors, the PSNP was designed to protect them from unexpected shocks. With consistent and prompt assistance, it was intended to be a long-term aspect of social service provided by the government (p 189). When compared with the program's intended objective, Sekota local officials influenced the PSNP to give resettlement preference over aiding the people in need. Because their pay and stability in the workplace depended on how many households they could convince to relocate, local officials were motivated to encourage relocation (p 199). The PSNP's justification here is not supported by the government in Sekota. To concentrate on people who would complete the program, they did not include the poorest sections of societies (households) in it (p 195). Instead of addressing the urgent needs of the poor who experience food insecurity, the authorities utilized PSNP as a vehicle to guarantee a group of volunteers for relocation (p 184).

When discussing the problems in attaining sustained completion of PSNP, Sabates-Wheeler, et al, (2021, pp 511-531) point to financial and political constraints that cause early completion of the

program (p 529). Firstly, the PSNP payments were frequently insufficient to produce the desired result because recipients especially the bigger households did not always get all the amounts to which they are supposed to take (p 522). The poor functioning of completing programs such as HABP which did not offer households sufficient skill and technical service exacerbate this financial deficit (p 523). Additionally, they demonstrate that early completion of the program is not realistic in terms of the time frame set or financial assistance provided. Secondly, due to the requirement to prove that completing the program, the authors revealed that there was great political motivation to move forward. As a result, targets for completion or quotas were imposed, and this forced local authorities to graduate households before actual time regardless of their preparedness (p 526). Households completing the program without adequate assets or security of food demonstrate how political pressure to reach these goals frequently led to the completion of the program without fulfilling predetermined requirements (p 521). The implementation is frequently viewed as being too low and it is not indicative of actual changes in livelihood, which were already impacted by the political environment (p 527). Therefore, since the support and design were poorly considered, this can fail the program. The difference in findings results from the many facets of policy implementation that each study examines. For example, different perspective on PSNP effectiveness results from Bishop & Hilhorst's emphasis on politics at the local level and Sabates-Wheeler, et al, emphasis on administrative and structural concerns, which results in differing perspectives on PSNP effectiveness.

According to the research of McCann, et al, (2023, pp 1-16) and Scognamillo, et al, (2024, pp 1-19) the PSNP's indirect impact and the significance of public opinion are discussed. The recipients of the PSNP also had less opportunity to be harmed by droughts, for Scognamillo, this suggests the benefit of the program to the community included in PSNP (p 9). In this regard, PSNP beneficiary households have a 23% lower chance of suffering losses in crop and a 48% lower chance of experiencing failure of the crop because of droughts (p 8). Furthermore, by giving beneficiaries access to new information and skills, the PSNP boosts their ability to change by giving financial transfers that support their security of food and consumption. This is necessary for investing in an agriculture-based economy like Ethiopia and enables to build tangible assets, which are harder for non-beneficiary households to access (p 4). For this construction of communal amenities like conserving water and soil as part of PW lessens the community's vulnerability to shocks, which benefits direct PSNP beneficiaries and their families. Furthermore, compared to non-recipients of the PSNP, recipients were 79% less probable to experience food insecurity because of the drought and, additionally, their duration of experiencing food insecurity is shorter (p 7). This is because, non-beneficiaries are less likely to engage in activities that adapt to the climate, which is the main aim of the program.

The duration of hardship is notably shorter "(-0.76 months)" than that of non-beneficiaries, where the PSNP is not available. With greater coverage and higher monetary advantages, McCann et al, (2023, pp 1-16) highlight the PSNP's contribution to reducing the effects of COVID (p 2). The initiative increased financial assistance in rural areas by roughly 22% and gave advance payment to urban residents (p 5). This preventive strategy assisted in preventing PSNP recipients from the significant disruptions to the economy brought on by the epidemic including higher food

prices and income losses (p 1). Non-beneficiaries, on the other hand, encountered more major difficulties. So, these households are more prone to the pandemic's economic effects, for example, to employment and business operations which resulted in lower incomes of the households (p 4). Furthermore, they are more vulnerable to rising food prices without extra assistance because no safety net like PSNP protects them (p 6). However, there are still weaknesses and vulnerabilities that need a long-term plan in place to tackle future shocks into account is believed to be necessary. In this regard, the various parameters and outside variables that each study considers like COVID, and climatic shocks influence the way PSNP is viewed and its indirect effects which in turn affect the variance in the community included in PSNP and family perceptions.

Hoddinot, et al, (2012, pp 761-786) and Gazeaud & Stephane, (2023, pp 265-290) examine how the PSNP affects the productivity of agriculture. According to Gazeaud & Stephane, there were only minor improvements in production indicating that infrastructures built to improve programs (for example through public works) did not produce the desired results (p 285). Thus, the PSNP is linked to very minor changes in agricultural output. Contrary to current stories that assert a significant increase in the productivity of land, the primary estimate proposes a higher limit equal to a 2.2% rise in production in agriculture (p 265). The absence of large effects on both lowland and highland areas, regardless of the variable employed, is in line with this finding (p 278). The writers investigated several possible explanations for these no consequences. They consider the potential impact on the PSNP crop portfolio changes, land use patterns, and spending money on fertilizers. They do not, however, reveal any proof that these elements account for the absence of beneficial impact on output.

Hoddinot, et al, revealed that high PSNP involvement alone did not significantly impact inputs for agriculture utilization or its output. It was discovered that between 2006-2010, households included in PSNP did not demonstrate an increase in production in agriculture as evidenced by changes in yield, area, or cereal production (p 776). According to this, PSNP-based income transfers via PSNP could not be enough to encourage large investments in agriculture or increase in productivity. They point out that PSNP when merged with other programs such as the "Other Food Security Program (OFSP)" and HABP, it improves results from agriculture. This is because PSNP payment levels combined with OFSP/HABP programs resulted in a significant increase in fertilizer use and increased agricultural investments, which are expected to raise household production in agriculture that received both programs (p 761). The study also emphasized how the joint PSNP-OFSP/HABP procedure is special since it offers both productivity-boosting transfers of income and investment, which are difficult to turn into cash and might not be easily traded in local marketplaces. Assisting households in contributing inputs to the OFSP/HABP contributions, allows them to make agricultural investments while mitigating shocks related to investment (p 764).

Therefore, the disparity in results can be attributed to variations in both programs examined and approaches of the methodology employed. For example, Hoddinot considers PSNP's integration with other programs, but Gazeaud & Stephane concentrate on PSNP alone which results in differing conclusions on productivity effects.

4.4 Methodological factors influencing

Longitudinal data is useful for following PSNP changes throughout time, and Abay, et al, 2023 used it to evaluate COVID-19's impact on the security of food. The researchers produced a thorough analysis of the effectiveness of the program by controlling for gradual time variation between PSNP beneficiaries and non-beneficiaries using difference-in-difference techniques with fixed impact in the households (p 3). This approach has the benefit of separating the PSNP's effect from other factors, allowing for the conclusion that the program significantly reduced the pandemic's negative effects on food security. Nevertheless, the PSNP was successful, the entire effect may have been overestimated or understated due to issues like sample attrition and other biases from phone survey techniques (p 6). Similarly, Sabates-Wheeler and Deveraux, 2010 used a two-wave panel survey that made it possible to monitor changes over time within the same households. Through observation of the same participants over time, this longitudinal technique helped to prove causality by providing solid data on variation in the rise of income, asset accumulation, and food security (p 274). The panel design showed that, particularly in the setting of high inflation, a combination of transfers produced better results than cash alone (p 280). The applicability of these results is hindered by the absence of national representativeness (p 278), indicating that although the PSNP is useful in specific situations, its wider applicability is still debatable.

Mixed method approaches were used by Azadi, et al, 2017 and Lavers, 2013 to combine both quantitative and qualitative data to give a thorough knowledge of the socio-demographic implication of PSNP and how it interacts with policies about land tenancy. Modern knowledge of member dynamics was made possible by Azadi, et al, (2017, p 4), utilization of structured interviews, and qualitative observation from PSNP representatives. However, the result could be biased by possible sampling bias and the use of self-reported data (p 12), which could result in conclusions that do not accurately reflect the program's effectiveness across different demographics. To explore the relationship between food security and social protection programs, Laver's study merged quantitative data from the "Ethiopian Rural Household Survey (ERHS)" with qualitative information collected from interviews with representatives and residents. This strategy emphasized the coercive character of the "Household Asset Building Program (HABP)" and the difference between the goals of policy and the actual situation on the ground (pp 13-15). Although the case study focus restricts the applicability of the findings to other regions, the mixed methods gave a deeper knowledge of the PSNP's issues (pp 16-17). Mixed method approach is also preferred and applied in the PSNP impact assessments produced by donors. For example, (Roelen, et al, 2017, p 4) on the report that evaluate PSNP indicated that conducting different rounds of data collection using mixed approaches (after some years gap) enables to estimate different attributes in case of quantitative and to provide context and enable the analysis of the impact of the PSNP that has been noticed.

Cross-sectional and stratified sampling designs respectively were employed by Engidaw, et al, 2023 and Welteji, et al, 2017 to evaluate consumption behaviors and the PSNP's effectiveness across various ecological zones. The cross-sectional design used by Engidaw, et al, (2023, p 2) gave an overview of dietary patterns. Still, the study's inability to prove causality constrains the

long-term results of the PSNP effects on dietary outcomes. The dependence on secondary sources also introduced potential biases about the accuracy and thoroughness of the data (p 7). The program's influence in various agricultural contexts could be understood in Welteji, et al, (2017, p 3) stratified sampling approach, which guaranteed representation across various environmental situations. Regional differences in program effectiveness were found using this method; however, the results could have been impacted by "biases in self-reported data" (p 9) and a lack of research into non-farm economic activity (p 10). These restrictions imply that, despite the PSNP's effectiveness in some ecological zones, its overall influence on the expansion and variety of livelihood is still unknown.

The study of Bishop and Hilhorst, 2010 and Morrow, et al, 2017 applied qualitative longitudinal and ethnographic approaches, respectively to obtain a full understanding of the PSNP's regional implementation and its influence on children's experience with food insecurity. A modest understanding of the regional environment and day-to-day politics of policy execution was made possible by Bishop and Hilhorst's ethnographic methodology (p 183). The findings limited generalizability due to the concentration on certain villages however raise doubt about the PSNP's wider application even though it may work well in some local situations (p 191). Using a qualitative longitudinal approach Morrow, et al, (2017, p 2) were able to capture the changing conditions of children across time, offering insights into the effect that food security has on their livelihood. This approach demonstrated how children's decisions about employment and education are impacted cumulatively by food insecurity (p 4). However, the finding's limited applicability is due to the focus on a small, purposefully chosen sample (p 3) indicating that although the PSNP may lessen some of the negative effects of food shortage, its overall effectiveness in enhancing children's well-being is yet unknown.

The studies reviewed have demonstrated the use of mixed approaches which integrate quantitative and qualitative data to give a broad overview of the PSNP focusing on food (in) security. These mixed techniques can enhance findings by offering a detailed understanding of socioeconomic determinants and the characteristics of the implementation of the PSNP. For example, FGDs and KII are qualitative methods that might uncover cultural customs and informal structures that affect the program outcomes and may not be revealed by using quantitative methods only. Since gathering and interpreting data is subjective these qualitative findings could be biased. On the other hand, the quantitative approach provides a statistical method and the capacity to monitor changes over time. An example of these approaches is longitudinal surveys. However, longitudinal and panel data methodologies are limited by sample decline and absence of national representativeness in the studies reviewed. Reliability of the result is increased by these techniques which can spot patterns and evaluate long-term effects. In ethnographic studies, personal issues and local applications of programs were presented in detail but they also had limitation with national representativeness.

4.5 Contextual or time-related elements

Numerous contextual elements such as geographic, chronological, socioeconomic, and external situations, have a significant impact on PSNP outcomes. In this session, I explored how these factors impact the PSNP's result using data from several types of research carried out in Ethiopia throughout varying periods and geographic locations. Ethiopia's varied topography, including lowlands and highlands, greatly influences the effectiveness of PSNP. For example, Tigray region is part of research by Azadi, et al, (2017, p 1), which is prominent for its vulnerability to food insecurity because of recurring drought and dependence on foreign aid. Food insecurity is made worse by the region's difficult topography and variable rainfall patterns, making the PSNP's role essential in offering consistent support. Similarly, research conducted in the Amhara region by Bishop and Hilhorst, et al, (2010, p 190) emphasizes the difficulty of topography that restricts the yield of agriculture and calls for PSNP's assistance to guarantee food security.

The difference between agricultural and pastoral areas is emphasized in the research conducted by Sabates-Wheeler, et al, 2013 and Welteji, et al, 2017. The implementation of the PSNP faces difficulties in pastoral regions such as Afar and Somalia as well, because of the customary governance framework and practices for pooling resources in the community (Sabates-Wheeler, et al, 2013, pp 4-5). For example, the 2014 PSNP general report demonstrates that while a significant percentage of the poorest households are excluded, a wealthy household in both Afar and Ethio-Somalia regions participate in PSNP at high rates. Since the initiative is mostly implemented by woreda and kebele staff, there were no significant attempts to increase their capacity (Hoddinott, et al, 2015, p 7). However, to maximize program effectiveness in these areas, capacity building, customized strategies that consider regional factors like the commercialization of animals and climate shock are necessary. The PSNP's PW's initiative that increase agricultural output, and infrastructure is advantageous to rural areas (Sabates-Wheeler, et al, 2013, p 2).

The first 10 years of the PSNP are covered in the paper by Sabates-Wheeler, et al, (2021, p 514) which highlights the program's development and difficulties encountered in its early stages. Early on, the goal was to provide a solid safety net; then after the focus shifted to encouraging graduation and long-term gains in livelihood. The study emphasizes the necessity of adapting the program to evolving circumstances and lessons discovered over time. The chronological setting of shocks to the environment and economy like the global food crisis of 2008-2009 has an extensive impact on PSNP results. Hoddinot, et al, (2012, p 764) pointed out that the crises increased the cost of staple foods dramatically making household food insecurity worse. This program's quality in the face of outside criticism was demonstrated by the PSNP's capacity to offer financial assistance via direct transfers and PWs, both of which were critical in reducing these difficulties.

Sabates-Wheeler and Deveraux's (2010, p 274) analysis emphasizes the way that inflation affected PSNP cash distribution lowering its actual worth and effectiveness. To guarantee food stability and economic expansion, this economic environment emphasizes the necessity for adaptable modes of transfer like mixed bundles of cash and food. Examples from other African nations are included in the paper to highlight the difficulties in putting cash transfers into place in

a setting where food transfers are unstable. Key social demographic characteristics like age, gender, and family size are found to be major variables in defining PSNP membership types, according to research by Azadi, et al (2017, pp 5-6). The program's emphasis on the most disadvantaged group is shown by the greater direct assistance given to elder people and smaller families. This socio-economic background affects how resources are allocated and how programs affect general food security.

The research conducted by Abay, et al, (2023, p 375) and McCann, (2023 p 15) highlighted the combined difficulties that Ethiopia's food system is facing because of the COVID-19 pandemic and locust invasion. These external shocks highlighted the crucial role the PSNP plays in supporting resilience in the face of such disasters by changing income-generating activities and increasing food insecurity. The details are discussed below. The program's significance in preserving food security is demonstrated by its capacity to adjust to these circumstances and keep helping families at risk. The impact of historical and political circumstances regarding the application of PSNP is highlighted in the study conducted in Tigray by Lavers (2013, p 466). The program's impact on local perspectives and reactions is shaped by the legacy of forced displacement during the Dergue regime and the TPLF's rule from the late 1970s onwards. These political and social variables have an impact on resource distribution and programs highlighting the necessity of context specific tactics that take political and historical factors into account.

Research on the PSNP conducted between 2010-2017, produced negative outcomes drawing attention to several program shortcomings and issues. During this time Ethiopia encountered several political and economic difficulties, taking inflation into account, which reduced the actual value of money transfers provided by the PSNP. The implementation and the results of the program were also impacted by political factors including concerns about governance issues, as stated in Sabates-Wheeler, et al, (2013, p 12). Research has also highlighted problems like poor transfer rates, early program termination, and a lack of accountability and transparency. These elements may make the program less successful in eradicating poverty and guaranteeing food security. The negative outcome of the research highlights the ongoing problems of Ethiopian poverty and food insecurity in other comparable settings. They demonstrate the need for broad, situation-specific analysis that considers both short-term problems and long-term development objectives. The study also emphasizes the degree of vulnerability of developing nations to shocks from outside sources and variations in the world economy. Also, they stress the importance of having strong dietary systems and social safety nets that can help people survive these kinds of obstacles.

The analysis of PSNP becomes even more complex when external shocks like the COVID-19 epidemic and locust invasions occur. The PSNP is important for maintaining food security since it supports resilience in times of crisis as highlighted by Abay, et al, (2023, p 375) and McCann, (2023, p 15). Because of its flexibility and resilience-building strategies, studies on Ethiopia's PSNP during the COVID-19 pandemic and locust invasion from 2020 onward have shown promising (positive) results. Amid the pandemic and locust invasion, the PSNP scheduled transfers have proven essential for risk management and enhancing food security. The program's PW initiatives, which prioritize soil and water conservation have improved the adaptability and

resilience of the local population. Furthermore, even in times of inflation and price volatility, the PSNP's large-scale support system, which combines cash and food transfer effectively solves issues of income growth and food security. The program's emphasis on most marginalized groups guarantees focused assistance, which is crucial in emergencies as stated in Abay, et al, (2023, p 388). The beneficial impact of the PSNP on the security of food and adaptive ability is more supported by empirical data from household surveys in the studies. These elements taken together highlight the extent to which the program works to improve the socio-economic environment and mitigate external shocks.

4.6 Data interpretation and analysis

To determine the PSNP's impact, quantitative studies like Abay, et al, 2023 and Gazeaud and Stephane often rely on statistical analysis. Using a difference-in-difference method, Abay, et al, (2023, pp 391-392) evaluate the PSNP's contribution to the COVID-19 pandemic and conclude that it greatly reduced inadequate access to food in lower-income households. This approach highlights the protective fractions of the program by enabling a transparent, unbiased comparison of the results between PSNP recipients and non-recipients. On the other hand, Gazeaud and Stephane, (2023, p 267) assess agricultural productivity using satellite data and comparable statistical methods, and they conclude that the PSNP did not considerably increase productivity. Their emphasis on agricultural outcomes as opposed to specific food security criteria results in an alternative assessment of the effectiveness of the program. This demonstrates, however, when applying comparable quantitative approaches, conclusions can be shaped by the selection of outcome variables and data sources.

Qualitative studies that examine the dynamics and application of socio-politics issues of the PSNP, studies by Bishop and Hilhorst, 2010 and Lavers, 2013 offer an alternative viewpoint. Bishop and Hilhorst, (2010, pp 193-194) use ethnographic techniques to show how local governments favor relocation over direct assistance for the poorest section of society, frequently keeping them out of PSNP programs. Using the qualitative lens, the difference between local customs and the goal of national policy is shown, providing insights that could be overlooked by using only qualitative data. To examine the connection between social security programs and the security of food, Lavers (2013, p 477) integrates quantitative data derived from the ERHS with qualitative interviews. His research draws attention to the political goal of PSNP execution including preserving political stability and reducing urban migration. This method demonstrates what qualitative information can offer context for quantitative findings and richness by exposing underlying socio-political issues that affect program success.

Different interpretations of comparable data may result from the subjectivity of qualitative analysis. For example, Bishop and Hilhorst, (2010, pp 192-193) concentrate on the language of reliance when local officials use the framing of dependency mindset to justification for not including the impoverished residents. This view is influenced by the researcher's emphasis on local power relations and the application of policies; it would be different if an alternate coping strategy or resiliency in communication were the subject of another study. Lavers (2013, pp 471-472) explains the PSNPs' support for poor agricultural policies and its restriction of immigration

are interpreted as serving political goals. Interviews with local officials and citizens were used to create this story, which emphasizes how policies are implemented hierarchically. The same data could be interpreted differently by a different researcher who might concentrate on the PSNP's capacity to keep rural economies stable or its unforeseen effects on nearby job marketplaces.

Research conducted by Welteji, et al, 2017 and Sabates-Wheeler, et al, 2013 combine qualitative and quantitative data to offer a more thorough study. In the analysis of PSNP's application in pastoral areas, Sabates-Wheeler, et al, (2013, pp 5-7) emphasize the significance of unofficial power hierarchies and resource exchange customs using qualitative data. In opposition to the targeting criterion, their quantitative research shows that wealthier households are frequently incorporated into the program. The program's success and shortcomings can be understood more deeply due to the combination of approaches. To evaluate the PSNP effect on food security, Welteji, et al, (2017, pp 6-7) use a mixed-method approach to quantify increases in food spending and consumption figures through statistical techniques. Their FGDs and Key Informant Interviews (KII) provide qualitative insights that draw attention to problems such as poor monitoring and dependency syndrome (pp 8-9). This combination of data offers a fair-minded viewpoint that considers both the program's strengths and weaknesses.

The studies offer supportive proof to back up their conclusions, frequently in the form of participant quotations or statistical data. For instance, PSNP participation decreased the chance of "food insecurity by 9.3 percentage points" according to Abay, et al, (2023, pp 391-392) offering a correct quantitative indicator of the effectiveness of the program. On the other hand, Bishop and Hilhorst, (2010, pp 195-196) demonstrate how manipulation of the PSNP is used to forward resettlement goals through qualitative evidence, like interviews with local government officials. To supplement his qualitative findings, Lavers, (2013, p 466) provides quantitative data from the ERHS which demonstrates that most respondents own less than half-hectare plots of land, which is insufficient for sustainably producing food. This mix of data types reinforces his claim regarding the interdependence of social safety programs and their socio-political implications.

4.7 Research constraints and prejudices

The most common source of bias is the procedure used to collect data. For example, Abay, et al, (2023, p 378) draw attention to the COVID-19 pandemic's dependence on phone surveys, which brings prejudices because of the unequal access to mobile phones. The initial sample was biased toward wealthier households because only 54% had access to a phone. This bias may produce results that do not represent the circumstances of lower-class households while overestimating the program's effectiveness among rich participants. Similarly, Azadi, et al, (2017, p 5) address the possibility of prejudice in interview results, wherein respondents may give socially acceptable responses. Findings that do not fairly represent the actual effect of the PSNP regarding the intended audience may arise from these biases. For instance, in the report prepared as an output to social protection like PSNP where Participatory Rural Appraisal (PRA) conducted in Afar communities of Ethiopia, the method used to collect data seems a solution to reduce bias regarding procedure of data collection. In this case, the administration of villages as well as representatives and beneficiaries were consulted before starting to select participants in data

collection (Fre, et al, 2017, p 5). This procedure could be necessary to balance composition, inclusion, and addressing intended target. So, the bias will be reduced in this case.

Findings may also be impacted by biases introduced by the period of data collection. According to Abay et al, (2023, p 9), surveys carried out in different seasons may result in an overestimation or understanding of modifications in the insecurity of food. Research findings may vary depending on when the survey is carried out. For instance, a survey done during the lean season may reveal a higher level of food insecurity than one during harvest time. Because of this seasonal bias, it may be more difficult to determine how the PSNP affects food security because the results can change based on the timing of the data collection. Divergent results can also be a researcher's viewpoint and biased interpretation. Bishop and Hilhorst, (2010, p 184) recognized that ethnographic methodologies are prone to subjectivity and that researcher's perception of encounters may create biases. Because of this subjectivity, different results regarding the PSNP's effectiveness may result based on the experiences and viewpoints of the researchers. Lavers (2013, p 479) also draws attention to the ways that different researcher viewpoints could affect how policy impacts are interpreted. For example, one researcher may see the PSNP as a political control instrument. Due to these biases, studies may highlight various facets of the program producing conflicting results.

Another crucial element influencing varying elements is the findings' generalizability. Numerous types of research concentrate on certain issues or demographics, which restricts their relevance in wider settings. For instance, Sabates-Wheeler and Deveraux, (2010, p 278) point out that because their sample is limited to woredas and local areas, it is not representative of Ethiopia as a whole. Due to this constraint, conclusions regarding the PSNP impact may differ depending on whether research findings from one study can be applied to other places with distinct socio-economic situations. Divergent study can also result from methodological variation such as biases associated with sampling and missing variables. The difficulties in providing causation resulting from the use of cross-sectional and secondary data are covered by Engidaw, et al, (2023, p 7). Because of this constraint, research that examines the efficiency of the PSNP may come to differing findings since they may not take into consideration all relevant factors. Concerns regarding bias from missing variables and statistical power are addressed by Gazeaud and Stephane, (2023, p 267) who point out that their checks indicate these biases are unlikely to account for the absence of effects. Other research, however, might not use comparable checks producing different results.

Findings may be more complicated by political and societal factors, such as beneficiary targeting selection biases. According to Welteji, et al, (2017, p 9), beneficiary selection is impacted by ethnic politics and "political graduation". These variables may lead to the inclusion of households that do not fairly represent the target demographic which can bias data on the performance of the program. Studies claiming varying degrees of program success may result from these biases contingent on the degree of these impacts in the research areas. Variation in results can also be caused by non-response biases and attrition. According to Abay, et al, (2023, p 378), 41% of the initial sample was lost during the phone survey. This might lead to bias if the households that are polled were not systematically different from the households that were unable to be reached.

Findings that do not fairly represent the experience of the target group as a whole may result from this bias. Comparatively, Sabates-Wheeler and Deveraux, 2010, p 278) report a 7% rate of attrition between surveys, with households that are replaced perhaps having different characteristics from those that are lost. Due to these biases, research that examines the impact of PSNP may come to differing conclusions regarding the degree of attrition and non-response.

Results may also be impacted by data restrictions and measurement errors. Potential measurement problems in self-reported PSNP involvement and transfer amounts are acknowledged by Abay, et al, (2023, p 388). These mistakes may cause mistaken evaluations of the program's effectiveness which could lead to differences in study results. However, different from the hypothesis of this study, the effects of variation in measurement used in the research is the case of specific studies that cannot work for all, and at the same time cannot be a reason for varied PSNP results. Hoddinot, et al, (2012, p 774) draw attention to data constraints that may have an impact on the accuracy of their research such as missing payment data. Due to these constraints research findings about the effectiveness of PSNP may vary based on the caliber and comprehensiveness of the data utilized. Diverse conclusions can be greatly influenced by the constraints and biases found in the research of Ethiopia's PSNP. From this, it is possible to make a convincing case for the essence of the research methodology that is transparent and rigorous. For accurate and useful insights to be produced, biases and restrictions must be addressed.

CHAPTER FIVE

5. DISCUSSION OF META-ANALYSIS RESULTS

Table 5 provides a summary of the characteristics of studies included in the meta-analysis analyzing the effectiveness of the PSNP across Ethiopia. The studies vary widely in sample size, ranging from 142 to over 8,595 participants, and cover multiple regions, including Amhara, Tigray, Oromia, Southern Ethiopia, and some nationwide analyses. Each study compares PSNP beneficiaries to non-beneficiaries or examines changes before and after PSNP participation, assessing outcomes such as household dietary diversity score (HDDS), food security, food consumption, women's BMI, height-for-age z-score (HAZ), resilience, and poverty headcount. The table details the number of PSNP recipients and non-recipients in each study, providing insight into the program's impact on food security, nutrition, and economic resilience across different settings and populations in Ethiopia.

Table 5: Characteristics of studies included in the meta-analysis on the effectiveness of the PSNP

Study ID	Author	Year	Sample size	Region	Comparison group	Outcome variables	Number of PSNP beneficiaries	Number of non-beneficiaries
1	Berlie,	2014	201	Amhara	Beneficiary and non-beneficiaries	Household Dietary Diversity Score (HDDS)	110	91
2	Belete & Bayu,	2023	228	Amhara	Beneficiary and non-beneficiaries	PSNP: participant/non-participant	115	113
3	Mesfin, et al,	2024	300	Tigray	Beneficiary and non-beneficiaries	HDDS	180	120
4	Teklewold, et al,	2022	7552	Amhara, Oromia, Tigrai & SNNPRS	Participant and non-participant	PSNP: participant/non-participant	2284	5268
5	Demsash, et al,	2023	8595	All regions including Addis Ababa & Dire Dawa	Cash and food receiving beneficiaries	Getting money or food from the PSNP: (yes/no)	1163	7432
6	Gebrehiwot & Castilla,	2019	3776	All regions excluding 3 zones of Afar & 6 zones of Somali	Participant and non-participant	HDDS	947	2805
7	Kassaw & Worku,	2024	142	Amhara	Before and after PSNP	Food security level of beneficiaries	142	142
8	Mustafa, et al,	2023	380	Amhara	Participant and non-participant	food consumption score (cont's)	175	205
9	Iremso & Atomsa,	2018	1258	Oromia	Participant and non-participant	Women's BMI and HDD	623	635
10	Tadesse & Zeleke,	2022	395	Southern Ethiopia	Beneficiary and non-beneficiaries	treated (program beneficiary) or not	198	197
11	Porter & Goyal,	2016	1886	Five regions	Post and pre-PSNP treatment	'Height-for-age' z-score (HAZ)	530	1356
12	Woldemichael & Alemu,	2024	300	Southern Ethiopia	Beneficiary and non-beneficiaries	Resilience	175	125
13	Hailu & Amare,	2022	188	Oromia	Beneficiary and non-beneficiaries	Participation in PSNP	94	94
14	Abdullahi, et al,	2024	507	Harari, Somali & Diredawa	Beneficiary and non-beneficiaries	Poverty headcount	235	272
15	Woldemichael, et al,	2023	300	SNNPRS	Beneficiary and non-beneficiaries	HDDS	150	150

Table 6: Meta-Analysis of the effectiveness of the PSNP

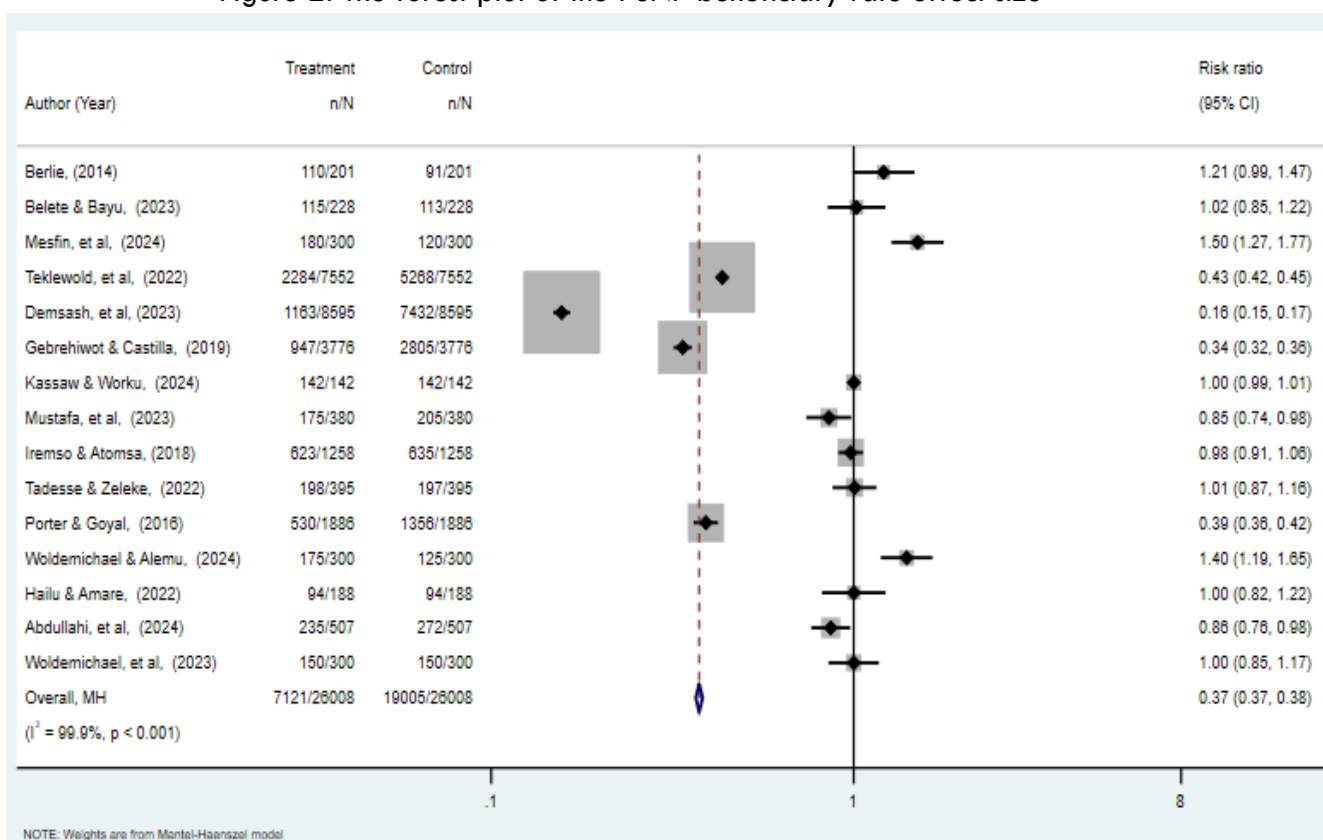| Author	Risk ratio	[95% Conf. Interval]		% Weight
Berlie, 2014	1.209	0.992	1.472	0.48
Belete & Bayu, 2023	1.018	0.847	1.223	0.59
Mesfin, et al, 2024	1.500	1.270	1.772	0.63
Teklewold, et al, 2022	0.434	0.418	0.450	27.72
Demsash, et al,2023	0.156	0.148	0.165	39.11
Gebrehiwot & Castilla, 2019	0.338	0.319	0.358	14.76
Kassaw & Worku, 2024 *	1.000	0.986	1.014	0.75
Mustafa, et al, 2023	0.854	0.740	0.985	1.08
Iremso & Atomsa,2018	0.981	0.907	1.061	3.34
Tadesse & Zeleke, 2022	1.005	0.874	1.155	1.04
Porter & Goyal, 2016	0.391	0.362	0.422	7.13
Woldemichael & Alemu, 2024	1.400	1.188	1.650	0.66
Hailu & Amare, 2022	1.000	0.817	1.224	0.49
Abdullahi, et al, 2024	0.864	0.763	0.978	1.43
Woldemichael, et al, 2023	1.000	0.852	1.174	0.79
Overall, MH	0.375	0.367	0.383	100.00

Test of overall effect = 1: z = -89.011 p = 0.000

Using the data in Table 6 as a starting point, the effectiveness of the PSNP is evaluated, with PSNP beneficiaries classified as the treatment group and non-beneficiaries as the control group. A risk ratio (RR) of 0.375 with a 95% confidence interval of [0.367, 0.383] is the overall meta-analysis result. This indicates that, in comparison to non-beneficiaries, PSNP beneficiaries are substantially less likely to experience the negative outcome (which could include food insecurity, poverty, or other socioeconomic hardships). For PSNP beneficiaries, the risk is specifically decreased by about 62.5% (1 - 0.375). The statistical significance of the result is indicated by the fact that the confidence interval does not include 1. The z-value of test of overall effects of PSNP is -89.011 and a p-value of 0.000 indicates extremely strong evidence that the PSNP is effective in reducing the targeted negative outcomes. The p-value being far less than 0.05 shows the effect is highly significant.

Particularly, Demsash et al. (2023, pp 1-13): this study indicates a very strong effect of the PSNP in reducing the negative outcome, with a risk ratio of 0.156 and a significant weight (39.11%). Beneficiaries of PSNP are 84.4% less likely than non-beneficiaries to experience an negative outcome, according to the extremely low RR. With an RR of 0.434 and a weight of 27.72%, Teklewold et al.'s (2022, pp 1191-1205) study likewise demonstrates a significant effect. Accordingly, beneficiaries of the PSNP are 56.6% less likely to suffer the negative consequence. Gebrehiwot & Castilla (2019, pp 1947-1966) and Porter & Goyal (2016, 92-99): these studies demonstrate noteworthy decreases in risk, with relative risks (RRs) of 0.338 and 0.391, respectively, encouraging the PSNP's effectiveness. Whereas, some studies, such as Berlie (2014, pp 191-202), Belete & Bayu (2023, pp 1-12), Woldemichael, et al, (2023, pp 1-17), show risk ratios close to 1 (1.209, 1.018, 1.00 respectively) with confidence intervals that include 1. These findings suggest no significant effect of the PSNP in those particular settings or populations, or perhaps a different outcome was being measured. While the overall effect is significantly positive, the variability among individual study results (some showing no significant effect, others

showing strong positive effects) indicates that the PSNP's effectiveness might vary depending on specific contexts, regions, or populations.

Given that the overall risk ratio of 0.375 indicates a significant reduction in risk, the PSNP is generally effective in lowering the risk of negative outcomes among its beneficiaries. The studies suggest that the PSNP is highly efficient in lowering the likelihood of negative socio-economic conditions like poverty and insecurity of food. Conversely, the variability in the study-specific findings implies that the PSNP's impact may differ based on regional circumstances, the effectiveness of its implementation, and particular demographic or socioeconomic factors. Additional research on these factors may aid in maximizing the program's effectiveness in various contexts.

Figure 2: The forest plot of the PSNP beneficiary rate effect size

Author (Year)	Treatment n/N	Control n/N	Risk ratio (95% CI)
Berlie, (2014)	110/201	91/201	1.21 (0.99, 1.47)
Belete & Bayu, (2023)	115/228	113/228	1.02 (0.85, 1.22)
Mesfin, et al, (2024)	180/300	120/300	1.50 (1.27, 1.77)
Teklewold, et al, (2022)	2284/7552	5268/7552	0.43 (0.42, 0.45)
Demsash, et al, (2023)	1163/8595	7432/8595	0.16 (0.15, 0.17)
Gebrehiwot & Castilla, (2019)	947/3776	2805/3776	0.34 (0.32, 0.36)
Kassaw & Worku, (2024)	142/142	142/142	1.00 (0.99, 1.01)
Mustafa, et al, (2023)	175/380	205/380	0.85 (0.74, 0.98)
Iremso & Atomsa, (2018)	623/1258	635/1258	0.98 (0.91, 1.06)
Tadesse & Zeleke, (2022)	198/395	197/395	1.01 (0.87, 1.16)
Porter & Goyal, (2016)	530/1886	1356/1886	0.39 (0.36, 0.42)
Woldemichael & Alemu, (2024)	175/300	125/300	1.40 (1.19, 1.65)
Hailu & Amare, (2022)	94/188	94/188	1.00 (0.82, 1.22)
Abdullahi, et al, (2024)	235/507	272/507	0.86 (0.76, 0.98)
Woldemichael, et al, (2023)	150/300	150/300	1.00 (0.85, 1.17)
Overall, MH	7121/26008	19005/26008	0.37 (0.37, 0.38)
(I^2 = 99.9%, p < 0.001)			

NOTE: Weights are from Mantel-Haenszel model

A meta-analysis evaluating the PSNP effectiveness across several studies is displayed in a forest plot. The PSNP has a significant protective effect; the overall pooled risk ratio (RR) is about 0.37, with a confidence interval spanning from 0.37 to 0.38. This indicates that the PSNP lowers the risk of the harmful outcomes it aims to prevent such as food insecurity and poverty by roughly 63% on average. Its statistical significance is confirmed by the p-value of less than 0.001.

Most individual studies report RRs less than 1, demonstrating the program's effectiveness in various contexts. For example, the studies by Demsash et al. (2023, pp 1-13) and Gebrehiwot & Castilla (2019, pp 1947-1966) show particularly strong protective effects, with RRs of 0.43 and 0.16, respectively, indicating strong reductions in risk due to the PSNP. However, some studies,

such as those by Mesfin et al. (2024, pp 1-29) and Woldemichael & Alemu (2024, pp 1-12), report RRs greater than 1, suggesting that in certain contexts, the PSNP might be associated with an increased risk of negative outcomes, possibly due to unique circumstances or study-specific factors.

The I^2 value of 99.9% indicates a very high level of heterogeneity across the studies, meaning the effectiveness of the PSNP varies significantly depending on the context, population, and implementation strategy. This variation suggests that while the PSNP is generally beneficial, its impact is not uniform across all settings, highlighting the need for context-specific adaptations to maximize its effectiveness.

The forest plot suggests that the PSNP is generally effective in reducing the negative outcomes it aims to address. Most studies show a significant protective effect, with a pooled estimate indicating that the PSNP reduces the risk by approximately 63% (RR ~ 0.37). However, the program's effectiveness varies significantly across different settings, as shown by the high heterogeneity. This indicates that while the PSNP is broadly beneficial, its impact may be influenced by specific contextual factors, requiring modified implementation to optimize its effectiveness. The meta-analysis indicates that the PSNP effectively reduces targeted negative outcomes, likely related to poverty or food insecurity. Nevertheless, the program's effectiveness varies substantially across different studies, as evidenced by the high heterogeneity. In most instances, the PSNP significantly lowers the risk of negative outcomes, but in some studies, the effect is neutral or even negative. This underscores the need to consider local context and implementation quality when evaluating the PSNP's impact.

CHAPTER SIX

6. CONCLUSION

Since its establishment in 2005, the program has been essential in tackling ongoing food insecurity. Even though the PSNP has demonstrated the short-term positive effect in enhancing food security, especially in times of COVID crises, the challenges still stand in the way of long-term reduction of food insecurity and poverty. However, the program's effectiveness has been disputed, though, with research indicating both advantages and disadvantages. This study focused on differences in the finding of research relating to Ethiopia's PSNP. The study thorough critical literature review has revealed several reasons that contribute to the different findings seen in research papers reviewed. These consists of variations in methodology, research biases, contextual and geographic factors, timing, and the method of data collection and analysis. These factors can divert the study into different results (positive and negative), for instance, methodology as a main guide of each study reviewed.

Considering the differences across studies, we can group or synthesize the review for five different schools of thought or thematic areas for better readability and comprehension: (1) biases and variation in methodology, (2) contextual or temporal elements, (3) implementation of the program and implications for policy, (4) effect on poverty alleviation and food security, and (5) research biases and limitations; each offering different viewpoint on the difficulties and effectiveness of the program. The differences in PSNP studies are not only the product of different approaches but also have their roots in the specific time-based and relative context of individual studies. To generate accurate and practical findings, research techniques must be rigorous and transparent as this study has confirmed.

The meta-analysis demonstrates that the PSNP is broadly successful in achieving its goals of reducing food insecurity and poverty. With an average risk reduction of approximately 63% (pooled RR ~ 0.37), the program significantly lowers the likelihood of negative outcomes among beneficiaries. This protective effect is statistically strong, as confirmed by a p-value of less than 0.001, and is consistent across individual studies. However, the high level of heterogeneity ($I^2 =$ 99.9%) indicates that the effectiveness of the PSNP varies considerably based on regional context, population characteristics, and implementation practices. While the program is generally beneficial, these findings suggest that localized adaptations may enhance its impact in specific settings. From this, the PSNP proves to be an effective strategy for mitigating poverty and food insecurity, though adapted approaches are recommended to optimize outcomes across diverse environments.

The principal limitation of this study is its dependence on analysis based on secondary sources or literature, which limits the capacity to gather primary data and evaluate the PSNP's influence firsthand. Thus, it is suggested that to have a thorough understanding of the PSNP impact, coming studies should use primary data that include longitudinal studies. Time series data could also be useful because it will provide an opportunity to record the progress of the program making it possible to track changing circumstances over time. The validity of the results can also be improved, and biases can be reduced in this way by including a variety of actors in the study

process. A more illustrative image of the PSNP's impact throughout Ethiopia will be provided by broadening the demographic and geographical scope of research, which will also increase the generalizability of output. This study helps to direct future studies and assessments of other programs in different contexts guaranteeing that findings are thorough, in addition to emphasizing the value of different methodologies to analyze the success of social initiatives. Policymakers can create more successful programs that tackle root cause of the food shortage and poverty by knowing the elements that influence PSNP's failure or success.

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Appendices

Ethics form approved by supervisor: email screenshot (see number 3 below)

Andrew Fischer
To: Melese Tefo Worasa
Mon 5/27/2024 2:4.

Hi Melese,

At this point, I suggest that I give you my comments after your seminar tomorrow. However, in brief, from what I see from the red text, you are simply adding on text in response to my comments. This will not be sufficient. What you need to do is to redraft your text, not to simply build on your existing text, which will make it increasingly fragmented and incoherent.

Regarding your questions:

1. The research problem/question is the most important and you should focus on this. Research objectives (or motivation) should NOT simply be a restatement of your question, as this will lead to a repetitive text. Rather, objectives should be a brief statement of what you seek or envisage achieving with your research. It is a chance to think of the 'so what' question, e.g., what would answering your question help us to understand?
2. No – you are not doing fieldwork. The fund is for fieldwork.
3. Ethics form is fine. There are no issues, so you do not need to consider more than this.

Best
Andrew

...