UNIVERSITY FOR DEVELOPMENT STUDIES

EFFECTS OF FARMER PARTICIPATION IN POLITICS ON INPUT EXPENDITURE AND AGRICULTURAL LABOUR PRODUCTIVITY

KOKA ALEXANDER KOLOG

2026

UNIVERSITY FOR DEVELOPMENT STUDIES

FACULTY OF AGRICULTURE, FOOD AND CONSUMER SCIENCES

DEPARTMENT OF AGRICULTURAL AND FOOD ECONOMICS

EFFECTS OF FARMER PARTICIPATION IN POLITICS ON INPUT EXPENDITURE AND AGRICULTURAL LABOUR PRODUCTIVITY

KOKA ALEXANDER KOLOG

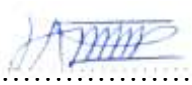
UDS/MEC/0004/23

THESIS SUBMITTED TO THE DEPARTMENT OF AGRICULTURAL AND FOOD ECONOMICS, FACULTY OF AGRICULTURE, FOOD AND CONSUMER SCIENCES, UNIVERSITY FOR DEVELOPMENT STUDIES, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF PHILOSOPHY DEGREE IN AGRICULTURAL ECONOMICS

MARCH, 2026

DECLARATION

I hereby declare that this thesis is the outcome of my own effort, and that no part or whole of it has been presented for another degree at this university or elsewhere.



…… Date 16th March, 2026

Koka Alexander Kolog

(Student)

We hereby declare that the presentation of this thesis was supervised in accordance with the guidelines on the supervision of thesis laid down by the University for Development Studies.

…… Date 16/03/2026

Dr. Yazeed Abdul Mumin

(Principal Supervisor)

…… Date 16/03/2026

Dr. Abukari Abdul-Basit Tampuli

(Co-Supervisor)

DEDICATION

I dedicate this work to Almighty God.

ACKNOWLEDGEMENT

My first and deepest praise, reverence, and infinite appreciation, on one hand, go to the Almighty God, who, by His divine guidance, mercy, and blessings, illuminated my way in the course of my painstaking yet highly enriching life's academic pursuit. Without His grace, strength, and wisdom, I could not have attempted this academic pursuit.

I want to express my deep and eternal gratitude to my supervisors, Dr. Yazeed Abdul Mumin and Dr. Abdul-Basit Tampuli Abukari of the University for Development Studies, Nyankpala, for their constant support and patience with me, as well as their superlative intellectual generosity. Both supervisors played an important role in my successful completion of this thesis through their consistent support, positive critique, encouragement, and intellectual guidance.

I would like to offer my profound and sincere appreciation to the staff of the Department of Agricultural and Food Economics and UDS School of Graduate studies for imparting and sharing their extensive knowledge, academic training, and incentives during the course of this thesis. I start off by conveying my profound sense of appreciation to Prof. Joseph Amikuzuno, Dr. Gilbert Dagunga, and Nanii Yenibeh my esteemed godfathers and brother respectively, whose mentorship, guidance, and grooming have had a very profound impact not only on my academics but also on my very life's journey right from St. John Bosco's College of Education to the apogee of my academic sojourn.

I am also very grateful to my valued friends, Abdulai Abdul-Shatar, Tahiru Abdul Jalilu, Ayaaba A. Atongi, Amisu Mohammed, Emmanuel Oteng, and Sarah Addea, who stood by me through it all over the past two years. I would like to appreciate and be thankful to Reverend Moses Sampana, Pastor James Yandoug, and Mr. Kpelaar Micheal, as these are respected individuals who, through spiritual advice and assistance, have kept my head high at all times. I would like to appreciate and be thankful to Alhaji Abass, a distinguished individual through his assistance as my landlord in Nyankpala and my religious friend throughout my entire life, despite my religious affiliation. I am eternally grateful to my lovely brothers and sisters, Mary Anaba, Patience Baan, and Rita Lardy, who have made a lot of sacrifices and shown love towards me since our parents passed away. Although I am the youngest among them, I am still very aware that my academic achievements and development would not have been possible without my dear sisterly sacrifice.

Lastly, I would like to extend special thanks to my best friend, the most brilliant academic performer in St. John Bosco's College of Education as the Magna Cum Laude-Valedictorian, Atubga Karim Joshua Redeem, whose academic brilliance is complemented by his selfless commitment to my education and development. Your prayers, encouragement, and support have forever marked my life. I regard you as a brother in every sense of the word, and I pray that the Almighty God blesses you abundantly and continually strengthens the unbreakable bond we share.

ABSTRACT

Agriculture remains a critical livelihood activity and source of food security in Ghana. Although participation in agricultural activities and usage of agricultural inputs are highly affected by politics, yet there is little research regarding how agricultural activities are affected by political participation. Drawing on data from the Ghana Living Standards Survey Round Seven (GLSS 7), this thesis investigates the effect of political participation on agricultural input expenditure and labour productivity in Ghana. Guided by the political economy framework, the study addresses selection bias and endogeneity with a robust econometric approach. It uses a multivariate probit model to examine the effect of political participation on the sources of agricultural inputs used by farmers, a double hurdle model for the behaviour of input expenditure, and an Endogenous Switching Regression (ESR) model for the causal effect of political participation on labour productivity. The results show that political participation has a significant effect on access to agricultural inputs by farmers, especially through the government and informal sources of political influence. input expenditure analysis shows that politically-active farmers have a higher probability of spending on agricultural inputs and incurring higher levels of expenditure. Results from the Endogenous Switching Regression (ESR) model show that political participation has a statistically significant positive effect on agricultural labour productivity.

TABLE OF CONTENTS

Content **Page**

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

1D1F	One District One Factory
AETA	Agriculture for Economic Transformation Agenda
AMSEC	Agricultural Mechanization Services Enterprise Centre
ATE	Average Treatment Effect
ATT	Average Treatment Effect on the Treated
ATU	Average Treatment Effect on the Untreated
ESR	Endogenous Switching Regression
FGP	Feed Ghana Programme
FIML	Full Information Maximum Likelihood
FSP	Fertilizer Subsidy Programme
GASIP	Ghana Agriculture Sector Investment Programme
GH₵	Ghanaian Cedi (currency)
GLSS	Ghana Living Standards Survey
GLSS 7	Ghana Living Standards Survey Round 7
GIRSAL	Ghana Incentive-Based Risk-Sharing System for Agricultural Lending
GSS	Ghana Statistical Service
IFAD	International Fund for Agricultural Development
IPWRA	Inverse-Probability-Weighted Regression Adjustment
MoFA	Ministry of Food and Agriculture (Ghana)
MVP	Multivariate Probit
NGO	Non-Governmental Organization
PERD	Planting for Export and Rural Development
PFJ	Planting for Food and Jobs
SADA	Savannah Accelerated Development Authority

SAPIP	Savannah Zone Agricultural Productivity Improvement Project
SSA	Sub-Saharan Africa
SWC	Soil and Water Conservation
TH	Total Heterogeneity
VIF	Variance Inflation Factor
WFP	World Food Programme
YIAP	Youth in Agriculture Programme

CHAPTER ONE

1.0 Introduction

1.1 Background

Agriculture continues to be the backbone of most economies worldwide, particularly in developing nations, and contributes significantly to employment opportunities and food security (Ricciardi et al., 2018; Yamba et al., 2017). Farmers worldwide have increasingly recognized the importance of political involvement as a means to lobby for their entitlement to inputs (Boillat & Bottazzi, 2020; Wahyudi, 2021). This need for farmer political involvement is present in innumerable parts of the globe, where there have been protests by farmers against unfair policies in contrast to them, and they are demanding clear support from the Government and related benefits (Vercillo et al., 2020). One such example is that during 2020-2022, Indian farmers staged massive protests in Delhi against the deregulation of input market and demanded guaranteed minimum support prices (Hastings & Ubilava, 2024). Small-scale farmers and land rights movements in northern Uganda and Ghana, also used collective resistance through coalitions with civil society and even United Nations (UN) agencies for land tenure protection and policy advocacy (Laing & Weschler, 2024; Vercillo et al., 2020). These are just some of the broader global trends of farmers increasingly participating in political processes to ensure their interests are protected.

In West Africa, farmer organizations have emerged as very influential platforms for political interaction (Lin et al., 2021). Besides expressing the voice of farmers, these organizations are also involved in policy-making and deepening democracy (Boillat & Bottazzi, 2020). Despite all these opportunities, these organizations are often crippled by internal vulnerabilities, weak financial bases, and policy shortcomings that discourage effectiveness (Silva, 2018). Present political actors such as voters/Citizens and Interest groups who are prime advocates of farmers' interests and agricultural policy determinants are usually constrain (Minah, 2021; Mercoiret et al., 2007). These actors are usually tied to operational and funding limits and political under-representation or lack of powers to make their demands (Ma et al., 2023). The political economy of agricultural commercialization would, therefore, sometimes suggest that strategic decisions are influenced more by political reflections than farmers' real needs, as is common in Ghana (Teye & Nikoi, 2023). It directly ellucidates that strategic decisions are driven by political considerations and not farmers' real wants (Abdulai et al., 2024). For example, though the PFJ (Planting for Food and Jobs) has been commended for increasing production and youth participation in agriculture (Prah et al., 2023), the initiative has attracted some controversy from researchers (Iddrisu et al., 2022), with some critics insisting that the approach and the implementation have remained politicized (Asante, 2023), indicated that the allocation of resources at times is biased by political party alignment or administrative whim (Pauw, 2022).

Such concerns have intensified scholarly debate on the broader role of political engagement in shaping agricultural outcomes. Political participation and its effect on farmers' adoption of inputs and agricultural productivity has therefore become a multifaceted and increasingly debated issue in agrarian economics is a multifaceted and increasingly debated issue in agrarian economics (Agyemang et al., 2025; Beaman et al., 2021; Fasakin et al., 2022; Bates & Block, 2013; Goldstein & Udry, 2008). Political participation by farmers through cooperatives, social capital groups, or community discourse has been shown in some studies to enhance access to quality farm inputs and influence favorable policy decisions, as such engagement can strengthen farmers' procurement agency, reduce elite capture, and improve service delivery performance (Adams et al., 2020; Akpan & Udoh, 2016; Fischer & Qaim, 2012; Zhang et al., 2024). But whether politically active farmers take optimal advantage of such inputs over their inactive counterparts is unknown (Kehinde et al., 2021). Numerous studies have questioned whether benefits like subsidized inputs drive from government by political-active farmers are directed to productive effort utilization, labour and input utilization, and real output growth (Ayamga, 2023). These suggest that party-political participation may shift time and resources away from production to non-production activities, which are essential for effective input utilization and output maximization (Donkor et al., 2023; Kehinde et al., 2024; Nkegbe et al., 2022; Dubbert, 2019).

According to Wongnaa et al., (2023), although its importance is increasingly recognized, political participation in agriculture remains an issue that is relatively under-researched and insufficiently integrated within agricultural economics. Farmers' engagement in political processes may, however, bring certain benefits, such as influencing policy formulation or gaining access to resources through subsidies and other agricultural support programmes (Tengapoe et al., 2024 and Mogues & Do Rosario 2016). Agricultural cooperatives, for example, have been found to enable resource aggregation, enhance group success, and boost farmers' ability to adopt new agricultural technologies like water-saving technologies (Berhane et al., 2020). These agricultural cooperatives can serve as shock absorbers to imbalances in economic resources among the farming communities according to Duguma, (2016), so that there could be no discrimination in accessing agricultural inputs and overall productivity (Zhu & Wang, 2024).

Empirical research has shown that political patronage may influence subsidy distribution in agriculture, considering that farmers who have connections within politics tend to gain favors (Abman & Carney, 2020; Bardhan & Mookherjee, 2012; Chinsinga, 2011; Takeshima & Liverpool-Tasie, 2015). Through the examination of trends from this research, the study shall inform policies aimed at ensuring an unbiased distribution of inputs.

1.2 Problem Statement

Agriculture is the key driver of the economy in many developing states, particularly in Sub-Saharan Africa (SSA), where small-scale farmers form the backbone of the food sector (Kamara et al., 2019). As a means to boost productivity, the use of input subsidies, extension, and support services has largely been adopted (Chirwa & Dorward, 2013; Jayne et al., 2016), even though the offering of such support services is generally based on political party affiliations and not meritocracy (Akyeampong, 2024). In most settings, politically connected farmers, either by membership in a political party or their campaign efforts, are given preference in accessing subsidized agricultural inputs (Banful, 2011; Chirwa & Dorward, 2013; Jayne & Rashid, 2013). Evidence suggests that increased fertilizer use often promoted through subsidy programs has contributed to improved agricultural productivity in several African countries such as Malawi, Zambia, Kenya, Nigeria, and Ghana (Druilhe & Barreiro-Hurlé, 2012), the impact of farmers' political participation in shaping access to agricultural inputs and its subsequent effects on farm productivity remains relatively underexplored (Jinbaani & Wale, 2023). There is scant empirical exploration of whether being a politically-active smallholder translates to farmers' higher input expenditure or improved output achievements (Teye & Nikoi, 2023).

The political economy surrounding the distribution of input, expenditure on input, and agricultural productivity is therefore a very important but less-explored research agenda (Salifu & Salifu, 2024). In the context of empirical uncertainties, the policies

intended to benefit smallholder farmers have the propensity to entrench the existing gaps and challenges such as Unequal access to subsidized agricultural inputs among smallholder farmers, politically biased allocation of agricultural subsidies and support services, inefficient targeting of agricultural input subsidy programs, limited empirical evidence linking farmers' political participation to input access and productivity, persistent low agricultural productivity among smallholder farmers and weak integration of input access, input expenditure, and productivity in empirical studies according to Addai et al. (2023), especially in politicized settings where government resources are dispensed based on political considerations, and not on the grounds of priority (Alawode, 2025).

Furthermore, this research will attempt to investigate how political participation affects farmers' access to sources, their expenditure on inputs, and how it affects farm labour productivity. Through its focus on a politically significant rural environment, this research will try to establish a policy intervention that is informed, inclusive, and takes into account the political process that underlies agricultural input distribution and utilization.

1.3 Research Questions

Main research question: How does political involvement affect farmers' input access and their agricultural labour productivity

The specific Research Questions include

1. How does political involvement impact the sources from which farmers obtain their agricultural inputs?
2. How does farmers' political involvement affect their input expenditure?
3. How does political participation relate to agricultural labour productivity for farmers?

1.4 Research Objectives

Main Objective: Examine how farmer political participation affects their input access and agricultural productivity.

The specific Objectives include

1. To determine the effect of political involvement of farmers on their sources of agricultural inputs.
2. To analyze the effect of political involvement of farmers' on agricultural input expenditure.
3. To assess the effect of political involvement of farmers' on agricultural labour productivity.

1.5 Significance of the Study

This research makes an important contribution to the understanding the role of farmer organizations and institutions (Minah, 2022). Farmer cooperatives and associations are important institutions that support smallholder farmers by facilitating access to agricultural inputs (Abdul-Rahaman & Abdulai, 2020). These farmer organizations play a crucial role in improving the availability of inputs such as seeds, fertilizers, and agrochemicals. However, their effectiveness is often undermined by political interference and institutional weaknesses, which can result in biased allocation of subsidized agricultural inputs (Ouerghemmi et al., 2024). However, these are usually weakened by political interference and institutional weaknesses to grant biased access to subsidized farm inputs like seeds, fertilizers, and agrochemicals (GIRSAL, 2023). The understanding of how political connections affect sources of input acquisition, input expenditure, and agricultural labour productivity will be useful in recommending ways of refining governance structures in agricultural institutions, reducing political interferences, and ensuring effectiveness in input distribution (Teye & Nikoi, 2023; Malimi, 2023). This study is, therefore, intended to show how such political clientelism distorts these systems and ways through which more significant levels of transparency, autonomy, and accountability can be ensured in the management of farmer organizations (Asante, 2023). This study will provide evidence-based recommendations to the various ministries, development agencies on how to create more all-inclusive and politically

neutral systems for distributing input (Tetteh et al., 2025). These challenges highlight the need for strong and support advocacy for reforming agricultural subsidies and extension services in a manner that allocation occurs based on needs and not for politically motivated delivery reasons (International Budget Partnership, 2021).

1.6 Limitations of the Study

While this study contributes to the understanding of the nexus of farmer political participation, spending on inputs, and productivity of agricultural labour, there are limitations that should be mentioned, as they can potentially shape the interpretation and generalizability of the findings:

Political participation is inherently intricate in nature. For the purpose of this study, political participation is operationalized through the lens of observable indicators that include political rally participation, political campaign support for a political party, as well as financial contributions to political campaigns. These indicators are far from being the foolproof measure for informal or even non-Institutional political participation formative in nature, such as grassroots lobbying, protests, social influence, that also significantly impact policy access, input distribution. The identification of the relationship between political participation and agricultural productivity is even harder in a methodological manner, given concerns with endogeneity. Farmers who take part in politics might already have an advantage or might be people with their own networks

and resources that affect their productivity. Although highly sophisticated econometric methods like instrumental variable estimation are being used in the study to confront reverse causality and omitted variables, none of these methods can eliminate endogeneity concerns completely.

The study is specific to the rural agricultural communities geographically located within Ghana. Thus, the results will not necessarily be easily generalizable to urban agricultural units or to other nations possessing distinct governmental systems, levels of governance, or mechanisms of input delivery. Institutional capacity and policy execution may differ by region, yielding different results.

1.7 Organization of the Study

The research is organized into five chapters.

Chapter One provides background to the study, statement of the problem, research aims and questions, why the study is important, scope and limitations, and structure of the whole work. Chapter Two is a literature review. Chapter Two gives theoretical, empirical, and conceptual reviews that inform the study and locate it in the broader context of knowledge. Chapter Three describes the research method applied to the study. They are the study design, location, population, sampling procedures, sources of data, data collection techniques, and analysis methods applied. Chapter Four holds the results of the study and is buttressed with extensive analysis and discussion of the findings in light of the research questions and objectives. Chapter Five summarizes the important

findings, conclusions, policy implications, and recommendations for future studies that conclude the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter gives a thorough review of the theoretical as well as the empirical literature on the relationship between farmer participation in politics, input spending, and agricultural labour productivity. The review is conducted in a manner that is intended to highlight some of the theoretical constructs that can help explain how farmer participation in politics can shape agricultural performance. It also reviews how the key variables in this study, namely, farmer participation in politics, input spending, and labour productivity, are measured. This is followed by a review of the previous literature that had investigated these relationships in varied contexts.

2.1 Concepts and Evolving Forms of Political Participation

Political participation can be said to classically involve the kind or sorts of activities individuals use in trying to influence political decisions, political leadership, or policies (Van, 2014). Theoretical underpinnings useful in defining political participation have been offered by Nie et al. (1974), which described political participation as "those activities by private citizens that are more or less directly aimed at influencing the selection of governmental personnel and/or the actions they have taken (Brady et al., 1995). Participation requires intention and consequence, for example, voting, campaigning and protesting, more contemporary studies further specify and develop (Hoffmann & Lutz, 2021). Political engagement, according to

Theocharis & Van (2018), entails creative, personalized, and digitally mediated forms of participation, in line with the ways and means by which people participate in democracies in contemporary times. Political engagement is no longer limited to formal activities such as elections (Bode, 2017). It goes beyond more expressive practices, social media activism, symbolic protests, and politicized consumer choices. Jenzen et al. (2021) and Ekman & Amnå (2022) argue that this space allows for the appearance of marginalized or semi-engaged actors who may lack formal access to political sway but instead operate through more informal and symbolic channels.

Political participation can be defined as any voluntary individual or collective activity by individuals attempting to influence government action or policy decisions directly or indirectly. According to the Oxford Research Encyclopedia of Politics, 2021, this definition considers both the institutional and non-institutional mechanisms, as discussed in the works of Theocharis & Van (2017), same as Vromen, (2016), who observed that digital activism, issue-based mobilization, and even economic actions, such as political consumerism or donations, are right at the heart of contemporary citizens' political participation.

In addition, rally attendance or partisan campaigning falls into both the classic typology of participation and newer modes of expression (Verba & Nie, 1987). If citizens attend political rallies or participate in party machinery (Brady et al. 1995).

They are participating in what other analysts define as instrumental political activity, that is a way of obtaining visibility and priority in systems of patronage (Nathan, 2019). The patterns are further consistent with recent empirical studies (Anzia et al. 2022; Van 2014), who demonstrate that rural citizens would likely use political affiliation to leverage maximum gains from public policy, especially in agriculture and infrastructure.

Moreover, farmer political engagement is conceptualized in this study as farmers' participation in political rallies, campaigning for political parties, and contributing to help political parties or candidates, and it is not a marginal or symbolic activity, but rather a strategic move to exercise control over local relations of power and policy distribution. It is a real-world intersection of democratic praxis and rural living tactics, wherein politics is a forum for bargaining and negotiations for access to resources.

2.2 Politics and Accessibility of Agricultural Inputs

Political activism in the agricultural sector entails several activities by which farmers become involved with governance processes that surround their lives (Bottazzi & Boillat, 2021). They embrace farmers' involvement in political rallies, farmers' contribution to a political party, and farmers' campaigning for a political party or party candidate (Callahan, 2019).

But again, another avenue highlights the importance of political mobilization of farmers, especially in competitive democratic settings (Boone et al., 2025). Political activism from farmers' quarters can be a real and intelligent avenue according to Saha et al. (2021), through which rights can be asserted, policy direction altered, and accountability of public expenditure for farmers imposed (Asante, 2023). Without collective political activism of a sort, people in rural areas are deprived of access to national developmental programs. But hitherto, the blurring of lines between being a beneficiary and being favored remains a problem. Once programs like PFJ are applied as sources of political patronage rather than instruments of agricultural transformation, they can entrench profligacy, misalign market incentives, and potentially increase inequality for farmers (Asante & Mullard, 2021).

Therefore, the nexus of political participation in agricultural development is controversial. While political involvement can benefit rural farmers by giving them more voice in farm policy (Byaruhanga et al., 2025; Yeandle, 2025), it can also result in skewed input distribution, manipulated input demand, and uneven effects on farm production (Abdulai, 2021; Kuntashula & Mwelwa-Zgambo, 2022). This tension creates a basic background for evaluating farmers' political involvement on farm productivity in Ghana (Tetteh et al., 2025).

In Africa, and to a larger degree in sub-Saharan Africa, political involvement has been related to elite access to publicly delivered agricultural inputs, subsidized inputs, extension, and credit (Banful, 2011; Nyirongo & Khataza, 2025).

In Ghana, the Planting for Food and Jobs (PFJ) programme, launched in 2017, showed how political engagement influences farmers' access to agricultural inputs and extension services. In spite of that, the PFJ was conceptualized as a national program with a focus on inducing food production and creating employment opportunities with enhanced access to inputs, such that the initiative has been characterized as not being without political bias when its rollout by the majority is considered.

According to Amoako et al. (2025), this stipulates that most developing countries' input distribution arrangements trickle down to their local political landscape, with the result being that such countries overindulge in elite capture while leaving behind less connected politicians. In the same manner, studies on Ghana's PFJ by Aidoo et al. (2025), it was discovered that politically connected farmers, either through close political party links or lobbying of local assembly members, enjoyed greater access to subsidized fertilizer coupled with quality seed. Such findings are contrary to the state-led agricultural intervention expectation of state neutrality, as state neutrality is challenged in political participation implications related to input access to equity.

2.3 Political Participation and Input Expenditure

There has been a growing linkage between the issue of political activism and input expenditure in agriculture, particularly due to the preeminence of government-led subsidy programmes. At the global level, the World Food Programme refers to farmer participation in decision-making processes through which the equitable distribution of resources and limiting structural inequalities to a "minimum" can be achieved. WFP's 2023 Annual Report, however, mentions that politically mobilized farmers typically enjoy preferential access to priority inputs themselves. This not only widens inequality but can further result in wastage or over-utilization of subsidized inputs, with the overall result of decreasing short-and long-run agricultural productivity and system resilience (WFP, 2023).

In Africa, such patterns increasingly become clear once political patronage starts to permeate state resource allocation in agriculture. Most of the countries in sub-Saharan Africa have experienced the introduction of large-scale subsidies, but the structures created to execute these subsidies are politically influenced and institutionally constrained. This is similar to the rest of the world, but with more structural and institutional challenges in the African context.

The subsidization initiative initiated by the Ghanaian government through Planting for Food and Jobs (PFJ) and coordinated by the Ministry of Food and Agriculture (MoFA) aimed at enhancing agri-productivity through subsidizing farmers with

fertilizer, seed, and extension support. Nonetheless, politics plays a critical role in influencing the disbursement and efficiency of these resources. The vast cost approximated through rigorous investigations by GIRSAL and other institutions is in excess of GH¢2.7 billion for the period 2017-2021 for the subsidizing cost under PFJ (GIRSAL, 2023). The study highlights various inefficiencies, politics interfering with quotas being allocated secretly to poorly distributed input factors, right from hoarding to smuggling activities, as well as the impacts the above investments have failed to address. Also from the study, other factors such as delayed delivery and politicized remarks aiming to overemphasize administrative costs, meaning political patronage hinders efficiency in resources (GIRSAL, 2023; Kwaku, 2025).

Furthermore, from 2021 to 2022, the level of subsidy dropped from 50 percent to 15 percent, whereas the price of fertilizer for 50 kg in the market rose from GH¢96 to GH¢320. This rapid increase pressed farmers to access inputs outside international borders, recording poor market incentives and low affordability, partly attributed to politicized subsidy payment manipulation (Ievsieieva et al., 2024). By 2023, government subsidies had practically been scrapped, leaving all the input costs on the shoulders of farmers. This retreat policy frightened farmers and civil society organizations, who blamed rising input prices on low productivity and rising food prices (Agbolosoo & Hutagaol, 2024).

2.4 The Nature of Political Institutions in Africa and Ghana

An institutional framework actualizes political power in Africa to the extent that the formulation of agricultural policy is shaped through the triangular relationship that develops between the institutions of state, social actors, and external forces. Such an institutional framework has led to the development of the phenomenon of the fragmentation of policy arenas, whereby the ruling political elite use resources such as agricultural subsidies to cultivate political support, rather than focusing on productivity among all farmers (Resnick, 2024), thereby relegating small farmers in Africa to the margins due to a lack of political power. As argued by Pechlaner, (2010), "In Africa, the political power of the executive is so strong that, in reality, when it comes to policy formulation, the individual politician is effectively the only player in the political field.

Political institutions in Ghana show many of the same characteristics such as Patronage and clientelism in the distribution of public resources. Although Ghana has made advances in democratic consolidation with regular elections and relatively stable political contestation, public administration of resources remains highly politicized. The decentralization reforms of the Local Government Act (Act 462) were designed to bring government to the people. However, in practice, the control of resources and power is still largely with the central authority, downgrading the autonomy and efficiency of institutions at the grass root level (Ayee et al., 2024).

In Ghana, there also exist patronage networks in local institutions that influence the provision of agricultural inputs as well as public services (Akyeampong, 2024). Patron-client relationships affect fair access to state support in the form of input subsidy, agricultural extension, and rural infrastructure for farmers who support political candidates from ruling governments.

There is further intricacy arising from the involvement of traditional authority/chiefs in the governance of rural areas. In Ghana, traditional chiefs might serve as an actor between the state and its citizens, playing a crucial role in determining the distribution of land and the state's presence. Even if chiefs might serve an important mobilizing function in communities, their involvement in party politics might diminish equity and impartialness in the allocation of resources (Ubink, 2018).

However, this explains the effect of political actors or institutions on the Ghanaian input distribution pattern in agriculture. Note that the policies formulated by MoFA and its affiliates are distributed by authorities. This is where politics plays its part. In this case, the involved politically active farmers are given preferential treatment, while some are denied these inputs.

2.5 Agricultural Input Policies and Access

Government-sponsored agricultural input subsidy programmes have become prominent development initiatives, particularly following the global surge in food and fertilizer prices during the 2007–2008 food crisis and the 2021–2022 global

commodity price shocks. In Africa, it is no different, and efforts to initiate these programmes like sponsoring of subsidise inputs and relative programmes are being launched again to boost productivity and food security among small-scale farmers. Ghana is one of the leading nations that has initiated intensive programmes such as the Feed Ghana Programme (FGP), a flagship programme launched on April 2025, under Agriculture for Economic Transformation Agenda (AETA). The main target of FGP is to lead the transformation of the agriculture sector on 22 commodity value chains and achieve sustainable employment (MoFA, 2025).

Prior programmes that made the project succeed include the government bringing to market the 180,000 metric tonnes, or 3.6 million bags, of its fertilizer subsidy program, estimated to be GH₵207 million, courtesy of the Ministry of Finance (MoFA, 2019). The Savannah Zone Agricultural Productivity Improvement Project (SAPIP), initiated in May 2018 through the US$56.32 million loan, helped enhance the Planting for Food and Jobs (PFJ) project through mechanization and job training initiatives (MoFA, 2019).

These policies have had a measurable impact. Farmers participating in the fertilizer subsidy programme were distinguished by higher adoption of sustainable intensification practices and improved use of inputs (Source). This supports increased action throughout sub-Saharan Africa against climate issues and soil fertility decline,

supporting the importance of well-designed input access policies and technology adoption (Asante & Bawakyillenuo, 2021).

Pacing such interventions are investment from external sources. The Ghana Agriculture Sector Investment Programme (GASIP), a partnership of IFAD (International Fund for Agricultural Development)-Government of Ghana, is a six-and-a-half-year investment of approximately US$113.2 million focused on institutional systems, input access, and value chain development (MoFA, 2025).

2.6 Empirical Evidence

Empirical evidence across Ghana and large parts of sub-Saharan Africa confirms that political participation significantly affects farmers' access to inputs, spending patterns, and ultimately labour productivity. According to Banful, (2011), using district-level fertilizer voucher allocation data from Ghana's 2008 Fertilizer Voucher Programme, showed in Ghana how the 2008 fertilizer voucher programme was politically aligned, with beneficiary districts sympathetic to the ruling party's interests receiving more vouchers, thereby impacting the sources that farmers were tapping into. Parallel findings by Asante & Mullard (2021) and Pauw, (2022) drawing from policy reviews, government budget documents, and interviews with stakeholders in Ghana's fertilizer sector and, using secondary data and programme performance assessments of Ghana's Planting for Food and Jobs (PFJ), are that governance loopholes within the Fertilizer Subsidy Programme and Planting for Food and Jobs (PFJ) redirected channels of distribution,

typically at a loss to private vendors, and directed access through politically connected state outlets. These distortions directly affect input expenditure, as shown by Houssou et al. (2017), who analyzed household-level survey data from the Ghana Living Standards Survey (GLSS) combined with fertilizer subsidy programme records and subsequent reviews, which revealed that politically mediated targeting and pricing tend to reduce farmers' private spending by crowding out commercial purchases, even while public subsidy spending rises. Comparable evidence from Malawi's Farm Input Subsidy Programme (FISP) reinforces that political capture shifts both the level and source of input spending. Within the framework of labour productivity, Northern Ghana research by Adzawla et al. (2024), using farm-level survey data from Northern Ghana, confirmed that PFJ participants attained much higher maize productivity and incomes, which means that politically motivated programmes that effectively mitigate input constraints have the capacity to increase output per worker. However, more robust analyses by IMF (2024) caution that politically input programmes can raise productivity at the farm level, but leakages, and governance issues limit aggregate labour-productivity gains. Together, the studies emphasize that political influence and participation not only determine who gets inputs and from where, but also shape farmers' spending on inputs and to what extent these are translated into rises in labour productivity.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

Chapter Three presents the study location, study population, and the secondary data sampling procedures on which the secondary data used in the analysis were based. The chapter states the source and nature of the secondary data, together with the data extraction, cleansing, and structuring procedures utilized. The conceptual and theoretical frameworks to guide the study are also stated. Further, the chapter introduces the choice of econometric models, like the endogenous switching regression model, and variable selection, signs, and justification for including particular explanatory variables. These conform with the objectives of the study and are supported by various literature.

3.1 Research Design

For this research, a quantitative methodology will be appropriately utilized in seeking answers to this study's research question regarding the relationship between political participation and farm labour productivity/input demand in terms of magnitude and direction of this effect, that demands econometric analysis, an approach that seeks to explore causal relationships between variables (Creswell, 2014). The proposed method will test, in this current research context, the impact that political participation by farmers in terms of political contribution has on farm productivity/input demand.

Additionally, the use of secondary data sourced from nationally representative surveys improves robustness because nationally representative data sets provide a wide coverage of most of the demographic and economic strata. This makes generalizability of the data in this study possible, as argued by Johnston (2014). The data sets also provide a huge number of variables, which makes it possible to control confounding variables with a high degree of accuracy. This makes a combination of a robust study design and high-quality data sets an ideal base for evidence-based decisions.

3.2 Study Area

While the data used in this study is for the country as a whole, the research places it within the context of Ghana's agricultural belts, spanning all the country's ten (10) traditional administrative regions, now reorganized into sixteen. Each of the sixteen regions harbours diversified ecological belts comprising the coastal savannah, forest, and Guinea savannah belts (MoFA, 2022). Each of these belts possesses different agro-ecological characteristics that influence the type of crops cultivated, the farming systems adopted, and the agricultural activity calendar.

3.2.1 Geographical and Socio-Economic Overview of Ghana

Ghana, a West African nation, is situated in the Gulf of Guinea region. Ghana shares borders with Côte d'Ivoire to the west, Burkina Faso to the north, Togo to the east, and the Atlantic Ocean to the south. It has a total surface area of about 238,500 km²

and a population that is well over 30 million. Agriculture plays a vital role in the economic sustenance of the Ghanaian population, and the government has a democratic system of governance. Ghana has sixteen administrative regions.

Ghana's climate can be generally described as predominantly tropical but ranges from humid to semi-arid regions. There is a great effect of rainfall on the different modes of agricultural production. The economy can be said to be mainly agrarian, which employs a rather large number of people, mostly within the rural areas. The main forms of agricultural production include crop production, livestock farming, fishing, and forestry. These types of farming, both subsistence and commercial, exist across the country. Some of the major staple foods under crop production include maize, cassava, yam, rice, millet, and sorghum. On the other hand, the main cash crop that is a foreign exchange earner is cocoa.

Despite having a politically stable environment and a level of natural endowment, Ghana faces some of the greatest challenges in addressing the effects of the processes associated with climate variability, land degradation, and food security; more so among the smallholder farming communities. This has been of help in addressing the increasing need for approaches such as intensification of agriculture as well as the development of an approach that is resilient to climate variability.

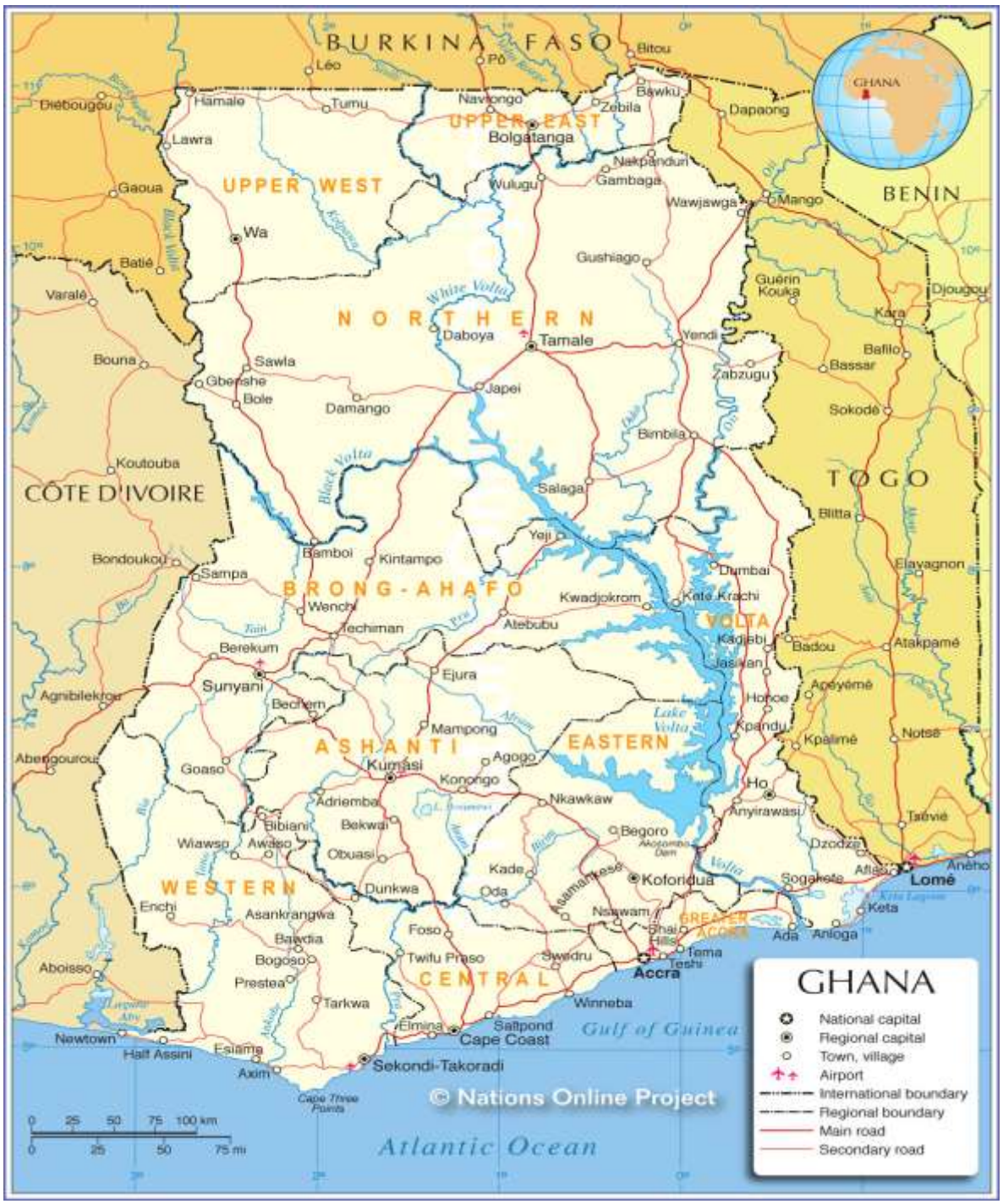


Figure 3. 1: Political Map of Ghana.

Source: UN Cartographic Section (2021)

Other than that, these regions will also exhibit variations in terms of their political engagement, availability of inputs for agriculture, and the extent of their integration with the market, which would be the result of varying infrastructural and policy developments and socioeconomic status as well. For example, agriculture will experience varying rainfall and availability of subsidies, such as those experienced by farmers in the savannah region as compared to those experienced by farmers in the coastal region and forest region (Benin et al., 2010). Spatial variation will add to the advantages of this study as it would enable an impact of political participation on inputs and productivity to be analyzed specifically.

The external validity of the results arrived at in the study is further supported by the geography of the data, which covers the whole of the regions in Ghana, thereby increasing the transferability of the research findings to the overall farming populace at large within the country. The fact that the overall regions are not all the same in size means that the relationships between political behaviour, demand for inputs, and productivity are not too specific with regard to the ecological and socio-political background.

3.3 Sources of Data

The study relies on data collected from national surveys and records by the Ghana Statistical Service. The Ghana Living Standards Survey Round 7 (GLSS7) data sources are the primary sources for information gathering as the study connects.

Ghana Statistics Service administers the GLSS7 and provides information regarding various elements essential for examining social and economic trends, the data was taken between October 22, 2016 and October 17, 2017 and was later released in October 2, 2018. These are the manners in which farmers or households engage in politics in which they obtain farm inputs (e.g., from government, Private Sectors, co-operatives, NGOs, and others), inputs that they use (e.g., seeds, fertilizers, and farm chemicals), and farm productivity intensity, i.e., yields and harvest volumes. The survey also has vast information on farm size and family characteristics that can be utilized to explore the connections of political participation, supply procurement, as well as farm production (GLSS, 2019; Ragasa et al., 2013).

The data have been cleaned to ensure they are complete, accurate, and suitable for the analysis (GLSS, 2019; Amoakoh et al., 2015). This involved handling missing values, outliers, and verifying twice the coding of the major variables. Several scholars have demonstrated that the data provided by the GLSS is valid and useful for development and policy-related studies in Ghana as in the view of Arndt et al. (2016), and thus applicable as well for identifying the impact that political participation has on farm production in Ghana.

3.4 Study Population and Unit of Analysis

A combined total of 6,637 farm - managing households were used from the national sample to conduct this research. The number aligns with the Ghana Living Standards Survey (GLSS) classification, according to which 44.1% of Ghanaian households either own or manage a farm. Region-wise, the prevalence of farming households is found to be highest among the population of Upper East (83.2%), followed by Upper West (80.4%), Northern (70.6%), Volta (66.7%), Brong Ahafo (62.3%), Eastern (58.4%), Central (52.0%), Western (51.7%), Ashanti (29.9%), followed by Greater Accra with 5.4%. Likewise, the rural-urban divide separates urban from rural households, with urban households being 74.4% more likely to own or manage a farm as opposed to 20.4% in urban areas (GLSS7, 2019). In alignment with the design and methodology employed by the GLSS7, a condition was applied to ensure that only farm households were retained if they actually grew the produce mentioned for the reference year (GLSS7, 2019).

Similar to the data structuring and approach followed in the GLSS7, the data was conditioned in such a way that only agricultural households that actually harvested crops within the reference year qualify. The agricultural modules in GLSS7 are categorized based on households that practiced agriculture and households that actually harvested crops.

For the above purpose, this study solely examined the data of farm households that harvested a minimum of one crop during the reference period. Thus, analysis about input use, productivity, and political participation is restricted to only those households with tangible farming outcomes, in alignment with GLSS7's focus on active farm households (GSS, 2019).

The procedure used above is consistent with standard approaches in secondary data analysis using nationally representative surveys, such as those adopted in previous studies such as Diao & Sarpong (2011) and Dzanku (2015), and aligns with GLSS definitions and classifications of the Ghana Statistical Service, 2019.

These farm households represent the wider farming community in the areas studied, exhibiting a range of social, economic, political, and farming characteristics (Malabayabas & Mishra, 2022). Each farm household is a unit in this study, with a focus on the head of the household. This person must be active in both farming and politics. This method is in line with what is common in farm economics research, where the household head is seen as the main decision-maker. This is true for studies that look at how farming and political behaviour connect (Ellis, 1993). By zeroing in on the household head or their stand-in, the study aims to get solid information on access to farming inputs, how much they produce, and how they take part in politics. These people are the ones in charge of such choices in rural farming areas. So, in conclusion, the unit of analysis for this study is the farm household. All variables,

including political involvement, input demand, and agricultural productivity, are measured at the household level using the Ghana Living Standards Survey dataset.

3.5 Conceptual Framework

The model below in Figure 3.2 illustrates the impact of farmer political participation on input access, expenditure, input utilization, and labour productivity in farming. Farmers become involved in politics by making political contributions, attending rallies, and participating in campaigns, whereby they improve their political players' relationship and raise their chances of accessing agricultural support. Political participation has a direct impact on the source of inputs, creates the availability of inputs, and influences the level of input spending. These mediating factors are household factors such as education, farm size, and gender of household head; institutional factors such as extension services, government programmes, and cooperatives; and socioeconomic factors such as income, farm size, and market access. Lastly, input access level and expenditure shape labour productivity, as the availability and affordability of quality inputs reduce the cost of production, enhance efficiency, and raise yield per unit of labour. In contrast, political network exclusion can constrain input access, increase expenses, and lower productivity performance. The model therefore demonstrates that political participation is a significant influencer of input use and productivity, whereas more general household, institutional, and socioeconomic determinants moderate the impacts.

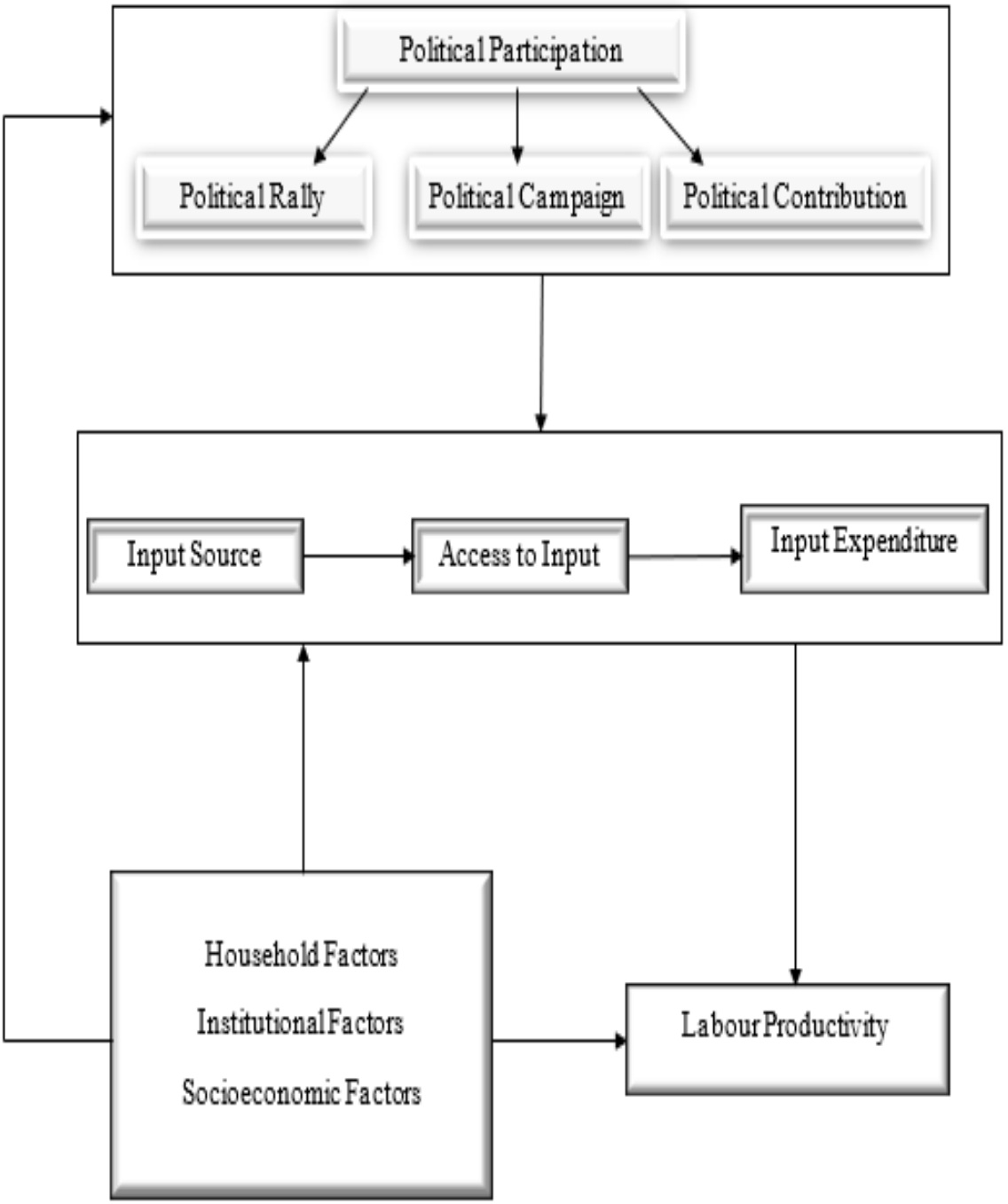


Figure 3. 2: Conceptual framework diagram

3.6 Political Economy Theory

The theoretical framework for this study is based on economic, political, and agricultural development theories that explain how farmers' political participation influences input demand and Agricultural labour productivity. The study brings together state-of-the-art theoretical approaches to investigate the channels through which political participation affects the access of farmers to resources and agricultural production. The main theories involved in guiding this study are the Political Economy Theory and the theory of Utility maximization.

This theory was developed by Adam Smith in his book The Wealth of Nations, 1776. The Political Economy Theory gives a general explanation of how political institutions, economic policy, and the productivity of farms cross paths, and it has been adopted in studies like (Acemoglu & Robinson, 2013). The Political Theory has argued that political decisions determine the economic consequences by selecting agricultural subsidy policies, land rights, and the availability of inputs.

At a broad level, in this research, the political involvement of farmers includes participation in political rallies, farmers' contributions to a political party, and farmers' campaigning for a political party or candidate. Politically powerful farmers will tend to have higher government-subsidized agriculture input supply, while politically marginalized farmers will tend to face supply shortages.

This formula suggests that politically active farmers may have greater input supply and productivity than non-politically active farmers. In this research, the researcher

backs the Political Economy Theory with the Public Choice Theory. This formula assumes that politically engaged farmers may have higher input supply and productivity than non-politically engaged farmers. In this research, we enrich the political economy theory using the Theory of Utility Maximization. The Theory of Utility Maximization, which is founded on microeconomic thought, asserts that individuals maximize their satisfaction or benefits depending on their preferences and limitations. Applied to this study, farmers engage in political action by means of rally, campaign, or contribution hoping to achieve maximum political utility in the form of greater access to inputs, subsidies, and farm support. Political leaders also try to extract maximum political benefit by politically distributing resources, fertilizers, seeds, and credit, among politically active farmers with the expectation of getting votes and remaining in office. This is why politically active farmers can be preferred when inputs are distributed, but politically inactive farmers will be unable to receive the same inputs. Third, the theory of utility maximization provides a mechanism through which one can observe the manner in which the politicians, as well as the farmers, pursue benefit-maximizing strategies leading to input demand and consequently to agricultural productivity.

In summary, the Political Economy Theory and the Theory of Utility Maximization synthesis provide a combined approach to finding out how political conduct influences access to farm inputs and hence farm productivity. The Political Economy Theory explains how institutions' structures and capacities influence economic

conditions and resource allocation, while the Theory of Utility Maximization attempts to explain how individuals, farmers, and politicians select activities in their efforts to maximize their own payoffs. Politicians engage the farmers politically, for example, by attending rallies, making contributions to campaigns, or enlisting when political utility in the forms of fertilizers, seeds, credit, or subsidies is higher than political participation costs. Politicians, in turn, direct these resources strategically to obtain maximal political utility through votes (Aidoo et al., 2025). Together, these theories support the central thesis of this study: political participation can affect access to input, demand for input, and productivity immensely, and the structure is crucial for determining whether politically active farmers receive preferential treatment and, if so, how it affects farm performance and fairness among farmers.

3.7 Dependent Variables

Farm input sources: This refers to where farmers get their farming supplies. These sources might be official or unofficial. They consist of businesses where farm inputs can be purchased (such as seed retailers, fertilizer and other agrochemical retailers and suppliers), government offices (such as the Ministry of Food and Agriculture that distributes farm supplies or offers them at reduced prices), large companies (such as those that cooperate with farmers for crop production), associations that assist farmers yet earn nothing (usually NGOs), other sources where farm supplies might be obtained, sources that might include neighbours, relatives, or associates and sources yet unknown within the data collection of the GLSS survey.

Input Expenditure: This is the input expenditure on input, and is measured as the total money spent by the farm household on key production inputs. These include, but are not limited to, chemical fertilizers (inorganic), seeds, pesticide products, and other farm chemicals and inputs required by the crops that the household is growing. Agricultural Labour Productivity: Labour productivity, the primary performance metric in this study, is estimated as the level of output attained per unit of labour input, typically controlled for size, simply the output (kg)/ total labour units. Alternatively, under a labour-based approach, the total agricultural output per adult-equivalent weight labour unit of the household is considered.

3.8 Key Independent Variables

3.8.1 Political involvement

Political involvement is captured by three dummy variables representing the extent of participation of the respondent in political affairs. These include: Political rally attendance (a dummy variable in which 1 is taken if the respondent attended a political rally and 0 otherwise), Political campaigns participation (a dummy variable in which 1 is taken if the respondent participated in any political campaign activity for his her political party or candidate and 0 otherwise), and Political contributions (a dummy variable in which 1 is taken if the respondent made monetary or material donations to any political party or campaign, and 0 otherwise). Voted in 2016 measures whether a farmer voted in the 2016 national elections. Input participation indicates whether the farmer participates in the input market sign of willingness to

adopt modern farming inputs. Farmer association membership captures membership in associations or cooperatives for farmers, which facilitate access to information, inputs, and collective benefits. Extension officer accessibility signifies whether the farmer is in contact with agricultural extension officers who supply technical knowledge for farming. Lastly, accessibility to a motorable road signifies whether the farm can be accessed using a motorable road, which affects the supply of inputs, market accessibility, and the reach of extension services. All these variables, therefore, signify how political participation, social connections, and infrastructure influence farmers in using inputs and productivity in farming. In the case of this specific research, the control variables take into account household, farm, socio-economic, and location factors that might shape farm input use and productivity. Age of household head represents experience, where the older farmer has more farm knowledge and possibly less adoption propensity with regard to new technologies. Male or female household head (male = 1, female = 0) explains differential endowments and decision-making powers within the farm. Household size measures the number of potential farm labour contributors, while years of schooling is an indicator of the household head's educational attainment that generally influences farm knowledge and adoption of improved farm practices. Farm size explains the scale of operation, where larger farm sizes are anticipated to accommodate larger farm input use and output. Finally, locality (urban = 1, rural = 0) controls for differences in access to markets, infrastructure, and government support

programmes. Together, these variables control for socio-economic and structural factors that may influence input participation, expenditure, and productivity outcomes.

Table 3. 1: Key Variable Measurement and A Priori Expectation

Variable	Measurement	MVP	Double Hurdle	ESR
Political Participation	1 if participated, 0 otherwise	+	+	+
Access to Extension Officer	1 if yes, 0 otherwise	+	±	+
Access to Motorable Road	1 if yes, 0 otherwise	–	+	–
Distance to Financial Institutions	Distance to extension/input institution (km)	+	+	+
Assets owned by Household Head	1 if owns productive assets	+	+	+
Farmer Association Member	1 if member, 0 otherwise	+	–	–
Input Participation	1 if participated, 0 otherwise	+	NA	NA
Age of Household Head	Household head age in years	+	+	+
Sex of Household Head	1 = Male, 0 = Female	+	+	+
Household Size	Number of household members	+	+	+
Marital Statues	1 = Married, 0 = Otherwise	+	+	+
Years of schooling	Total years of schooling	+	+	+
Farm Size	Acres of farmland	+	+	+
Input Expenditure	Average Amount Spent on Input (GHS)	+	NA	+
Locality	1 = Urban, 0 = Rural	+	+	+
Western	1 = Western region	+	+	+
Central	1 = Central region	+	+	+
Greater Accra	1 = Greater Accra region	+	–	–
Volta	1 = Volta region	+	+	+
Eastern	1 = Eastern region	+	+	+
Ashanti	1 = Ashanti region	+	+	+
Brong Ahafo	1 = Brong Ahafo region	+	+	+
Northern	1 = Northern region	+	+	+
Upper East	1 = Upper East region	+	+	+
Upper West	1 = Upper West region	+	+	+

3.9 Analytical Framework

3.9.1 Model 1: To estimate the effect of Political Involvement and Input Source

To examine the determinants of political participation with farmers' input source choice, this research uses a Multivariate Probit (MVP) model. This economic method is especially suitable since farmers tend to obtain more than one input source in one session, and their decisions among these input sources are dependent on each other. The MVP model allows for the estimation of multiple binary outcome equations simultaneously with correlation among the error terms of the equations, increasing the efficiency and precision of estimation. In this specification, the dependent variable is constructed as a string of indicators of whether or not a household received inputs from each of five alternative sources: private input sellers, cooperatives, MoFA, NGOs, and other sources. The main explanatory variables are binary indicators of political participation, i.e., farmers' participation in political rallies, political campaign activity, and political party donation. Some of these control variables are demographic and socio-economic in nature, such as age, sex, level of education, family size, area, and farm size.

The Multivariate Probit to estimate the effect of political involvement on the sources of inputs accessed by farmers is specified as:

Y_{ij}^{*} = The latent utility (unobserved preference) of the farmer *i* derives from choosing option j

Y_{ij}= 1 if $Y_{ij}^{*} > 0$, and 0 otherwise (observed binary decision),

X_{ij} = A vector of explanatory variables (political involvement, farm characteristics, etc.),

ε_{ij} = The error term that captures unobserved factors affecting each decision.

Then, the Multivariate Probit model is specified as:

$$Y_{ij}^{*} = X_{ij}^{'} B_j + \varepsilon_{ij} \qquad j = 1, 2, 3, \ J \tag{1}$$

$$Y_{ij} = \begin{cases} 1 & if\ Y_{ij}^{*} > 0 \\ 0 & otherwise \end{cases} \tag{2}$$

Where:

i= 1, ..., N: individual farmers,

j=1……, J: different choices/options (Private, Cooperation, MoFA (Government), NGOs, and $PoliticalParticipat_i$ Other).

$\varepsilon_i = (\varepsilon_{i1}, \varepsilon_{i2}, ..., \varepsilon_{iJ}) \sim MVN\ (0, \Sigma)$: the error terms jointly follow a multivariate normal distribution with mean zero and covariance matrix Σ.

Empirical model:

$$Y_{ij}^{*} = \beta_{0j} + \beta_{1j} Political\_Participat_i + \beta_{2j} househ\_size_i + \beta_{3j} age\_hhhead_i + \beta_{4j} sex\_hhhead_i$$
$$\beta_{5j} Farm\_Size_i + \beta_{6j} marri\_Statues_i + \beta_{7j} locality_i + \beta_{8j} years\_school_i +$$
$$\beta_{9j} amount\_spent_i + \beta_{10j} Access\_EXOfficer_i + \beta_{11j} Farmer\_AssMember_i + \beta_{12j} Distance\_FInstitution_i + \beta_{13j} Western_i + \beta_{14j} Central_i + \beta_{15j} Greater\_Accra_i +$$
$$\beta_{16j} Volta_i + \beta_{17j} Eastern_i + \beta_{18j} Ashanti_i + \beta_{19j} Brong\_Ahafo_i +$$
$$\beta_{20j} Northern_i + \beta_{21j} Upper\_East_i + \varepsilon_{ij} \tag{3}$$

For each binary decision Y_{ij} (whether farmer i accessed input source j):

3.9.2 Model 2: To analyze the effect of political involvement on Input Expenditure.

Model 2: Political Participation and Input Expenditure

This study estimates the effect of political participation on agricultural input expenditures through the use of the Double Hurdle Model, an extension of the Tobit model, which relaxes restrictive assumptions about zeroes. Unlike the Tobit, which always treats all zeroes as censored, the Double Hurdle model permits zeros to emanate from two distinct decisions: (1) the participation decision, which is whether a farmer chooses to spend on inputs or not, and (2) the expenditure decision, which is how much the farmer spends, conditional on participating.

Descriptive statistics of the sample data (N = 6,637) indicate considerable heterogeneity in input expenditure; 25% of farmers spent ₵100 or less, the median was ₵335, the mean was ₵853.30, and over 10% of respondents reported zero spending. The variable for input spending is both highly leptokurtic and right-skewed, violating the normality assumption underlying OLS. This gives reason for using a model that treats zeros not simply as censoring but perhaps as a separate decision. Indeed, zeroes may result from either non-participation in the input market or actual low affordability or demand, as acknowledged by the Double Hurdle model (Demsa et al., 2021; Terefe & Ahmed, 2016).

The model better captures the heterogeneous input behaviours of farmers by distinguishing between the decision to participate and the decision on expenditure amount. Application of the model in similar settings has revealed that the factors that determine the adoption differ from the factors that determine the level of usage. By employing the double hurdle model in the Central Rift Valley in Ethiopia, Terefe & Ahmed (2016) concluded that factors such as literacy, livestock holding, contact with extension services, and distance to the market played a role in the prediction of the adoption of organic fertilizer, whereas credit access, livestock, and plot characteristics determined the usage of the organic fertilizer.

3.9.2.1 Empirical Support for the Double Hurdle Method

The evidence based on data collected in Sub-Saharan Africa and elsewhere in the world implies that it is highly advisable to adopt the double hurdle approach in the combined process of input adoption. For example, in a study conducted in Ethiopia, the double hurdle method revealed that "large family size reduces the probability of adoption, whereas separately, both adoption and use intensity are positively related to farm size, irrigation, improved seed, and fertilizer use (Kassa et al., 2021).

In another recent case, Dachito & Angelo (2021) employed a double-hurdle model among small-scale farmers in Masha Woreda, Ethiopia, solely for the purpose of analyzing adoption and the intensity of use. The estimates found that adoption and intensity of use were highly influenced by education, gender, contact with extensions, and household size.

In addition, Tefera et al. (2020) applied a double-hurdle model to the analysis of malt barley technology adoption in Ethiopia, finding that age, farm size, participation in extension, road distance, and membership in an association are some of the most important characteristics in shaping the intensity of adoption.

In the Central Rift Valley of Ethiopia, a double hurdle approach was used by Terefe & Ahmed (2016) to analyze the use of organic fertilizer, revealing that though contact with extension, literacy, and holding livestock drives the decision to adopt, credit access, livestock, and market distance create the level of use for organic fertilizer. Taken together, these studies endorse a double-hurdle model as one that fits well for disentangling the two-stage process of adoption or participation and intensity or expenditure/use in agricultural input decisions.

The Double Hurdle Model assumes that the farmer's input expenditure occurs in two stages:

Participation (Hurdle 1): whether the farmer decides to participate in the input market:

$$D_i^* = Z_i'\gamma + u_i,\ D_i = \begin{cases} 1 & if\ D_i^* > 0 \\ 0 & otherwise \end{cases} \qquad (4)$$

Where:

- D_i^* = latent participation propensity of the farmer i
- Z_i = vector of covariates affecting participation (e.g., political participation, household size, farm size, access to extension)

- U_i~N(0,1)

Expenditure (Hurdle 2): how much the farmer spends, conditional on participating:

$$Y_i^*=X_i'\beta+\epsilon_i,\ Y_i=\begin{cases}Y_i^* & if\ D_i=1\\ 0 & if\ D_i=0\end{cases} \quad (5)$$

Where:

- Y_i^* = latent input expenditure of the farmer i
- X_i = vector of covariates affecting expenditure
- ϵ_i~ N(0,σ^2)
- The two error terms (u_i,ϵ_i) are assumed independent in the standard Cragg model.

Empirical model specification.

Participation Equation (Hurdle 1)

$$Input\_Participation_i^*=\alpha_0+\alpha_1 Political\_Participation_i+\alpha_2 househ\_size_i+\alpha_3 age\_hhhead_i+\alpha_4 sex\_hhhead_i+\alpha_5 Farm\_Size_i+\alpha_6 years\_school_i+\alpha_7 locality_i+\alpha_8 Distance\_FInstitution_i+\alpha_9 Access\_EXOfficer_i+\alpha_{10} Access\_MOroad_i+\alpha_{11} Distance\_Market_i+\alpha_{12} Assset\_owned_i+\alpha_{13} Pub\_Employee_i+\alpha_{14} Priv\_Employee_i+\alpha_{15} Self\_Employed\_NonAgric_i+\alpha_{16} Self\_Employed\_Agric_i+\alpha_{17} Unemployed_i+\alpha_{18} Retired_i+\alpha_{19} Central_i+\alpha_{20} Volta_i+\alpha_{21} Eastern_i+\alpha_{22} Ashanti_i+\alpha_{23} Brong\_Ahafo_i+\alpha_{24} Northern_i+\alpha_{25} Upper\_East_i+\alpha_{26} Upper\_West_i+u_i \quad (6)$$

Expenditure Equation (Hurdle 2)

Input_$expenditure_i$= β_0+β_1Political_$Participation_i$+$\beta_2$househ_$size_i$+β_3 age_$hhhead_i$+$\beta_4$sex_$hhhead_i$+$\beta_5 locality_i$+β_6Distance_$FInstitution_i$+β_7 Access_$EXOfficer_i$+β_8Farm_$Size_i$+β_9Assset_$owned_i$+β_{10}Pub_$Employee_i$+β_{11} Priv_$Employee_i$+β_{12}Self_Employed_$NonAgric_i$+β_{13}Self_Employed_$Agric_i$ +$\beta_{14} Unemployed_i$+$\beta_{15} Retired_i$+$\beta_{16} Central_i$+$\beta_{17} Volta_i$+$\beta_{18} Eastern_i$+β_{19} $Ashanti_i$+β_{20}Brong_$Ahafo_i$+$\beta_{21} Northern_i$+β_{22}Upper_$East_i$+β_{23}Upper_$West_i$ +ε_i (7)

3.9.3 Model 3: To assess the effect of political involvement on agricultural labour productivity.

In the estimation of the effect of political participation on agricultural labour productivity, total output per labour unit, this study employs the Endogenous Switching Regression (ESR) model. The ESR model is especially well-suited where political participation is not randomly assigned but may be driven by observed and unobserved factors, possibly also those that determine productivity levels. Therefore, ESR is selected on the basis of its ability to correct for selection bias and to estimate counterfactual outcomes, hence providing more accurate and policy-relevant estimates.

3.9.3.1 Empirical Evidence Supporting ESR Use in Agricultural Impact Analysis

The ESR model has been used in various recent agricultural economics research to address similar issues of selection bias and endogeneity, reaffirming its applicability to this study Ojo et al. (2021) recognized the Endogenous Switching Regression Model (ESRM) to be an attractive method for addressing selection bias in impact estimation of agricultural technologies, particularly in Sub-Saharan Africa. Applying the ESRM in combination with the doubly robust inverse-probability-weighted regression adjustment (IPWRA) to estimate the effect of the uptake of soil and water conservation (SWC) technologies on rice productivity among 360 smallholder rice farmers in Southwest Nigeria is their empirical contribution. The model fully described both the observable and unobservable determinants of adoption and performance, reaffirming the positive impact of SWC on productivity, as Assouto & Houngbeme (2023) applied an Endogenous Switching Regression model to maize farmers in Benin and found that self-selection bias was ignored, which resulted in overestimating credit access productivity gains. These analyses confirm that ESR models are particularly best suited to evaluating interventions or behaviour such as political participation, where selection is not random but can be endogenous to the productivity outcome. By controlling observed and unobserved heterogeneity, ESR provides a statistically appropriate basis for deriving average treatment effects, including those on the treated, thus the Average Treatment Effect

on the Treated (ATT), and those on the untreated, thus Average Treatment Effect on the Untreated (ATU).

The ESR model to assess the effect of political involvement on agricultural labour productivity is specified as: Let the latent variable P_i^* represent the unobserved propensity of farmer i to engage in political participation:

$$P_i^* = Z_{i\gamma} + \varepsilon_i \quad (8)$$

$$P_i = \begin{cases} 1 & if\ P_i^* > 0 \quad (political\ participant) \\ 0 & otherwise\ (non\ political\ participant) \end{cases}$$

Where:

- P_i is a binary indicator of political participation.
- Z_i is a vector of variables influencing political participation (political rally attendance, campaign contribution, community leadership, party affiliation).
- γ is a vector of parameters to be estimated.
- $\varepsilon_i \sim N(0,1)$ is the error term.

2. Outcome Equations (Labour Productivity Equations)

These equations are estimated separately for participants and non-participants:

- For political participants farmers ($P_i = 1$)

$$Y_{1i} = X_{1i}\beta_1 + u_{1i} \quad (9)$$

- For non-participants ($P_i = 0$)

$$Y_{0i} = X_{0i}\beta_0 + u_{0i} \quad (10)$$

Where:

- Y_{1i}, Y_{0i} Agricultural labour productivity (total output/number of labourers).
- X_{1i}, X_{0i} Vectors of covariates (e.g., age, education, sex, household size, farm size, extension access, crop type, region).
- β_1, β_0 Vectors of parameters.
- u_{1i}, u_{0i} Error terms are assumed to follow a bivariate normal distribution with the selection error ε_i.

Key Assumptions and Error Terms

The ESR assumes a joint normal distribution of the error terms:

$$(\varepsilon_i, u_{1i}, u_{0i}) \sim N(0, \Sigma)$$

with correlation terms:

- rho1=Corr(ε_i, u_{1i}) (11)
- rho0=Corr(ε_i, u_{0i}) (12)
- If rho1/rho $\neq$ 0, then selection bias is present, and OLS on the outcome equations would yield biased estimates.

Treatment Effects Derived

Using the ESR, you can estimate:

Actual Outcomes:

E(Y_1 | P=1): Expected productivity for politically active farmers

E(Y_0| P=0): Expected productivity for non-participants

- Counterfactuals:

E(Y_1 | P=0): What non-participants would earn if they were politically active

E(Y_0 | P=1): What participants would earn if they were not politically active

- Average Treatment Effects:

ATT (Average Treatment effect on the Treated) = E(Y_1 | P = 1) − E(Y_0 | P = 1)

ATU (Average Treatment effect on the Untreated) = E(Y_1 | P = 0) − E(Y_0 | P = 0)

Empirical model

Selection Equation

Political_$Participat_i^*$=α_0+α_1Voted_2016$_i$+$\alpha_2$househ_$size_i$+$\alpha_3$age_$hhhead_i$+α_4 sex_$hhhead_i$+α_5Fam_$Size_i$+$\alpha_6$married_$dummy_i$+$\alpha_7 locality_i$+$\alpha_8$years_$school_i$ +α_9Access_$EXOfficer_i$+α_{10}Distance_$FInstitution_i$+α_{11}amount_$spent_i$+α_{12}Pu b_$Employee_i$+α_{13}Priv_$Employee_i$+α_{14}Self_Employed_$NonAgric_i$+α_{15}Self_E mployed_$Agric_i$+$\alpha_{16} Unemployed_i$+$\alpha_{17} Retired_i$+$\alpha_{18} Western_i$+$\alpha_{19} Central_i$+ $\alpha_{20} Volta_i$+$\alpha_{21} Eastern_i$+$\alpha_{22} Ashanti_i$+α_{23}Brong_$Ahafo_i$+$\alpha_{24} Northern_i$+α_{25} Upper_$East_i$+α_{26}Upper_$West_i$+ε_i (13)

Outcome equations

a. For Participants (P_i=1):

Labour_$Productivity_{1i}$=β_0+$\beta_1$househ_$size_i$+$\beta_2$age_$hhhead_i$+$\beta_3$sex_$hhhead_i$+ β_4Farm_$Size_i$+$\beta_5 locality_i$+$\beta_6$years_$school_i$+$\beta_7$married_$dummy_i$+β_8Access_ $EXOfficer_i$+β_9Distance_$FInstitution_i$+β_{10}amount_$spent_i$+β_{11}Pub_$Employee_i$ +β_{12}Priv_$Employee_i$+β_{13}Self_Employed_$NonAgric_i$+β_{14}Self_Employed_ $Agric_i$+$\beta_{15} Unemployed_i$+$\beta_{16} Retired_i$+$\beta_{17} Western_i$+$\beta_{18} Central_i$+$\beta_{19} Volta_i$

$+\beta_{20}Eastern_i+\beta_{21}Ashanti_i+\beta_{22}$Brong_$Ahafo_i+\beta_{23}Northern_i+\beta_{24}$Upper_ $East_i+\beta_{25}$Upper_$West_i+u_{1i}$ (14)

b. For Nonparticipants (P_i=0):

Labour_$Productivity_i=\gamma_0+\gamma_1$househ_$size_i+\gamma_2$age_$hhhead_i+\gamma_3$sex_$hhhead_i+\gamma_4$ Farm_$Size_i+\gamma_5 locality_i+\gamma_6$years_$school_i+\gamma_7$married_$dummy_i+\gamma_8$Access_ $EXOfficer_i+\gamma_9$Distance_$FInstitution_i+\gamma_{10}$amount_$spent_i+\gamma_{11}$Pub_$Employee_i$ $+\gamma_{12}$Priv_$Employee_i+\gamma_{13}$Self_Employed_$NonAgric_i+\gamma_{14}$Self_Employed_ $Agric_i+\gamma_{15}Unemployed_i+\gamma_{16}Retired_i+\gamma_{17}Western_i+\gamma_{18}Central_i+\gamma_{19}Volta_i+$ $\gamma_{20}Eastern_i+\gamma_{21}Ashanti_i+\gamma_{22}$Brong_$Ahafo_i+\gamma_{23}Northern_i+\gamma_{24}$Upper_$East_i+$ γ_{25}Upper_$West_i+u_{2i}$ (15)

3.10 Robustness and Specification Tests

The nalysis applied robust diagnostic and robustness testing to all models such as multicollinearity, heteroskedasticity, and model specification tests, with added interaction terms if necessary for testing conditional effects of political participation, region, and institutional support. Diagnostics for the Multivariate Probit (MVP) model a cross-equation correlation tests was included, VIFs (Variance Inflation Factor), model fit statistics (Pseudo R^2, AIC, BIC), and simulation accuracy tests. The Double Hurdle model assessed by stage-by-stage VIFs, likelihood ratio tests in the nested models, distribution and link function tests (Modified Park, Pregibon Link), residual analysis, and zero-inflation tests with possible application of FIML

(Full Information Maximum Likelihood) in the event of high error term correlation. The Endogenous Switching Regression (ESR) model was tested with Hausman tests for endogeneity, Sargan tests for instrument validity, joint normality tests of error terms, VIF tests, and robust estimation of standard errors, along with reporting ATT and ATU with confidence intervals to measure the actual and counterfactual effect of political participation on labour productivity.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Introduction

The current chapter will discuss the results and findings, hence connecting them with the research objectives set in chapter one. It will serve as concrete evidence that political involvement affects agricultural input access, input expenditure, and labour productivity. The first research objective will be addressed by starting with the impact that political participation has on farmers' decisions in procuring sources for agricultural inputs, using a Multivariate Probit Model. Where the second objective of this research will be evaluated from how political participation affects input expenditure from the result of the Double Hurdle Model, while the result from the Endogenous Switching Regression Model about how political participation affects labour productivity will be used to evaluate the third research objective.

The chapter is organized into three major sections. First, the chapter describes some of the socio-economic and demographic characteristics of the respondents using descriptive statistics. This sets a background for the understanding of the econometric results that follow. Secondly, the chapter describes and interprets the findings obtained from MVP, Double Hurdle, and ESR models. Finally, this section compares the emergent findings with the available literature with a view to highlighting areas of convergence or deviation.

4.1 Descriptive Statistics and Preliminary Analysis

4.1.1 Socio-Demographic Characteristics of Respondents

Table 4.1 below presents selected socio-demographic characteristics of the sampled farm households and includes household size, age, sex, marital status, as well as years of schooling.

Table 4. 1: Socio-Demographic Characteristics of Respondents

Variable	Mean	Std. Dev.
Household size	5.178	3.157
Age of household head	48.820	15.478
Sex of household head (1 = Male)	0.769	0.421
Married (1 = Married)	0.670	0.470
Years of schooling	25.133	19.224

Table 4.1 shows the socio-demographic characteristics of the sampled farm households, which form an important context within which one understands the significance of personal and household characteristics on both political participation and agricultural outcomes. The average household size is about 5 members, implying that most households have moderate labour availability that may affect farm decisions and input use, and hence labour productivity. Based on studies conducted by GSS (2022) and FAO (2021), it is evident that the mean household size in typical rural households in the context of Ghana ranges from three to eight.

The average age of the head of the household is 49 years, with a fairly mature age for farmers in these communities. This correlates with Martey et al. (2025) and the African Development Bank (2021), who stated that the farming population in Ghana

is aging, with those from the elderly generation usually having a stronger connection to political actors in accessing agricultural inputs or subsidies.

The analysis indicates the gender composition of household heads to be 77% male. This is reflected in the rural household structure in the context of Ghana, where males continue to dominantly own, lead, and participate in the political structures in the agriculture sector. Findings by MoFA (2025) and Doss (2025) reveal male-headed households to have more political connections, agricultural programmes, and mechanisms to acquire agricultural inputs.

In relation to their current marital status, approximately 67% of the respondents were married. Research indicates that farmers who are married appear to maintain relatively stable social networks, which is a factor that augments their chances of participation in political activities, for instance, rallies, campaigns, as well as financial contributions, with a focus on influencing input access, according to research by Atta-Aidoo et al. (2022). The average level of schooling is 25 years, although there is considerable variability taking into account the measurement design. A higher level of education improves an agricultural producer's capacity to grasp political institutions, decode agricultural policies, and draw on aid provision. The study by Nchanji & Lutomia (2021) and World Bank (2025) indicates that education improves agricultural extension, enhances efficiency of agricultural inputs, and facilitates proper agricultural management practices, among various

factors taken into account, including labour productivity. In general, there is an observable socio-demographic characteristic suggesting that agricultural agriculture is practiced by an adult, largely male, moderately educated community, as found in most of rural Ghana. These characteristics shape political participation and, by extension, influence input expenditure patterns and labour productivity, as explored in later sections of this chapter.

4.1.2 Farm and Economic Characteristics

Table 4.4.2 presents the farm and economic characteristics of the sampled households, including farm size, input expenditure, access to extension services, input participation, labour productivity, and ownership of farm assets. These indicators provide the basis for the empirical understanding of how political participation can influence input expenditure and agricultural labour productivity.

Table 4. 2: Farm and Economic Characteristics of Respondents

Variable	Mean	Std. Dev.
Farm size (in acres)	10.526	161.331
Input expenditure on inputs (₵)	853.323	2,704.316
Access to extension officer (1 = Yes)	0.360	0.4802
Input participation (1 = Yes)	0.841	0.3654
Labour productivity	198.719	1,612.797
Assets owned (1 = Yes)	0.997	0.0548

Table 4.2 presents the farm and economic characteristics of the sampled households that are important for understanding how political participation may influence Input

expenditure and labour productivity. The mean farm size is around 10.53 acres, but the huge range from 0.009 to 8,000 acres suggests considerable variation in farm holdings (Abdul-Rahaman, 2023; Atta-Aidoo et al., 2022). Indeed, larger farms might provide greater opportunities for farmers to engage with political actors in order to access inputs, while extremely small farms may present little incentive, and equally little capacity, for political participation (Atta-Aidoo et al., 2022; Nchanji & Lutomia, 2021).

Expenditure on inputs averaged ₵853, but the high standard deviation and maximum suggest that a subset of farmers invests substantially more, possibly reflecting differential access to resources or political connections (Atta-Aidoo et al., 2022; World Bank, 2022). A high percentage of farmers (84%) report expenditure on inputs, , and 36% of farmers have access to extension officers, which has been shown to significantly improve farm productivity and household income among smallholder farmers (Doss, 2025; Kwapong et al., 2021). This would suggest that both political engagement and institutional support could influence input access and spending patterns, reinforcing the link between political participation and agricultural input investment.

Labour productivity averages about 199 units, with wide variation that reflects large differences in farm sizes, labour allocation, and access to inputs (Atta-Aidoo et al., 2022; Nchanji & Lutomia, 2021). Households that are politically participative may

potentially have high labour productivity if subsidized inputs or technical or extension services are provided (Doss, 2025). Lastly, the fact that almost every household owns farm assets (mean ≈ 0.997) means that most of them have basic capital with which to translate political engagement into actual farm production (Atta-Aidoo et al., 2022; Kwapong et al., 2021). To end with, the characteristics of these farms and the general economic context underscore how farmer participation in politics may potentially affect both expenditure on inputs and labour productivity, thereby underpinning the analysis of these effects in the subsequent econometric models (World Bank, 2022; Nchanji & Lutomia, 2021).

4.1.3 Behavioural and Institutional Variables

Table 4.3, presented below, describes the behavioural and institutional characteristics of the sampled farmers: political participation, association membership, access to all-weather roads and markets, and access to financial institutions are relevant for understanding their effects on input expenditure and labour productivity.

Table 4. 3: Behavioural and Institutional Variables

Variable	Mean	Std. Dev.
Political participation (1 = Participated)	0.394	0.489
Voted in 2016 (1 = Yes)	0.909	0.288
Member of farmers' association (1 = Yes)	0.375	0.484
Access to motorable road (1 = Yes)	0.923	0.267
Access to market (1 = Near)	0.544	0.498
Distance to financial institution (km)	11.683	12.767

Table 4.3 presents key behavioural and institutional characteristics of the sampled farmers, important for understanding the pathways through which political participation may influence input expenditure and labour productivity. Approximately 39% of the respondents are actively involved in politics, while up to 91% of the respondents said they voted in the 2016 elections, implying a politically engaged group of people (IFAD 2021). This will result in higher availability of agricultural goods and services, for example, because politically active farmers will mobilize their influence, for example, to get the services they need (Hillebrecht et al., 2023).

Roughly 38% of the farmers are members of a farmers' association, which could be meant for collective actions as well as information acquisition that could improve input usage as well as productivity of the farm (Jafari et al., 2023). More people, about 92%, are able to access a motorable road that could easily transport inputs as well as farm products to and from the farm land (McFarland et al., 2022). Likewise, 54% are able to access the market places for the convenience of purchasing inputs

as well as selling output at a profitable rate (Iddrisu et al., 2025). The benefits of infrastructure to political participation could supplement the extent of agricultural investment as well as labour allocation. The mean distance of the location to all kinds of financial institutions could be 11.7km, which implies moderate distance for accessing credits as well as savings (Appiah et al., 2022). Farmers with better access to financial services may have more opportunities to invest in inputs and hire labour, thereby increasing productivity. In general, these behavioural and institutional attributes imply that politically active farmers, in combination with good access to the market, extension services, and financial institutions, are more likely to use more agricultural inputs and to attain higher labour productivity, hence supporting the central theme of this study.

4.1.4 Regional Distribution of Farm Households Sampled

Figure 4.1 below shows a pie chart representation of the regional characteristics.

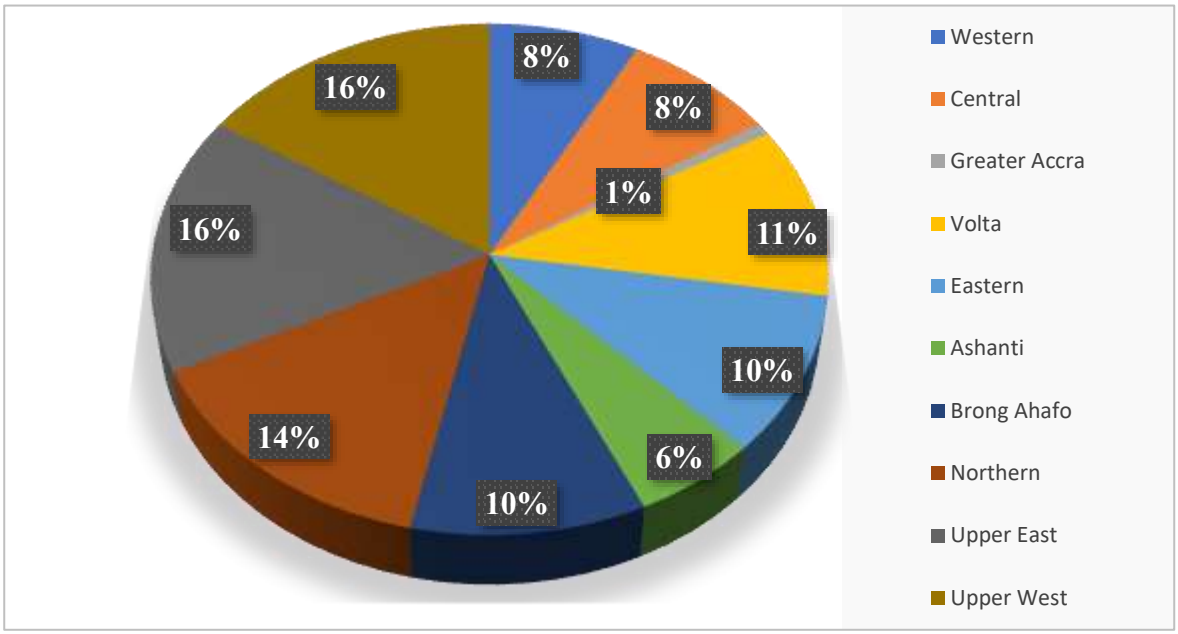


Figure 4. 1: Regional Characteristics

Figure 4.1 shows the regional distribution of farm households sampled in the study using a pie chart, and the respective share of respondents for each region is presented. The highest number of farmers comes from the Upper East (16%), Upper West (16%), and Northern (14%) regions, whereas the least number of farmers (1%) is from Greater Accra. The sample distribution indicates that the focus has been on mainly rural regions.

Regional location is one of the major factors in influencing political participation, access to agricultural inputs, and labour productivity. Farmers in different regions are most likely to have different levels of access to input distribution points, extension services, and political networks. For instance, it is expected that farmers

in the Northern, Upper East, and Upper West regions may be dependent on government or cooperative input programmes, and political participation can enhance the likelihood of receiving support. In turn, farmers in other regions with lower agricultural activity or more urbanized areas, such as Greater Accra, may have limited contact with any input schemes, hence affecting the variability of Input expenditure and productivity outcomes.

On the whole, this regional distribution portrays differences in contextual access to inputs and institutional support across Ghana. It also provides a basis for interpreting how farmers' political participation may influence input expenditure and labour productivity differently across regions.

4.1.5 Descriptive Comparison Across Groups

Table 4.4 below compares socio-economic and farm characteristics of participants and non-participants in politics. It reports means (or proportions) for continuous and categorical variables, the differences between the two groups, and the statistical significance of these differences, denoted by asterisks.

Table 4. 4: Comparison of Socio-Economic and Farm Characteristics Between Political Participants and Non-Participants

Variable	Participants Mean/ Proportion	Std. Dev.	Non-Participants Mean / Proportion	Std. Dev.	Difference
Farm Size (acres)	6.45	80.27	13.17	196.79	-6.72*
Input Expenditure (₵)	1,007.88	3,456.63	753.02	2,069.34	254.86***
Labour Productivity	178.20	1,327.72	211.83	1,771.18	-33.63
Household Size	5.55	3.34	4.94	3.01	0.61***
Age of Household Head (1 =male)	47.28	15.01	49.82	15.69	-2.54***
Years of Schooling	26.64	19.60	24.16	18.91	2.48***
Sex of Household Head	0.814	-	0.739	-	0.075***
Marital Status (1= married)	0.716	-	0.640	-	0.076***
Access to Extension Officer	0.333	-	0.378	-	-0.045***
Input Participation	0.878	-	0.817	-	0.061***
Farmer Association Member	0.344	-	0.395	-	-0.051***
Access to All-Season Road	0.939	-	0.914	-	0.025***

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

Table 4.4 presents the descriptive statistics comparing farmers who participate in political activities and those who do not. For continuous variables, participants and non-participants show notable differences. Farm size is larger for political participants (6.45 acres) than non-participants (13.17 acres), though the difference is marginally significant, while the input expenditure on farm inputs is significantly higher for participants (₵1,007.88) compared to non-participants 753.02 indicating greater investment in agricultural activities as similar socio-economic patterns linking resource levels and participation have been reported by Soviadan (2024) and Syamsu et al. (2025). Labour productivity shows no significant difference between the groups, suggesting similar output per unit of labour. Political participants have larger households (5.55 vs. 4.94 members, $p<0.01$), are led by slightly younger

household heads (47.28 vs. 49.82 years, p<0.01), and have more years of schooling (26.64 vs. 24.16, p<0.01), reflecting potentially better human capital and labour availability, consistent with findings by Udemezue & Oforle (2019). For binary and categorical variables, participants generally exhibit higher proportions of favourable characteristics: male-headed and married households are more common, input participation is higher (87.8% vs. 81.7%, p<0.01), while political participants are slightly less likely to access extension officers or be farmer association members, though differences remain statistically significant. Moreover, participants have marginally higher access to all-season roads than nonparticipants do (93.9% vs. 91.4%), which can be interpreted as a proxy for better infrastructure access and also squares with the wider evidence on the dynamics of access and participation (Okumu et al., 2023).

Taking these findings together, it appears that farmers who participate in political activities differ from non-participants along several socio-economic and farm-related dimensions; household size, education, and input spending may vary between these two groups, thus affecting their political engagement as well as agricultural outcomes, as supported by Soviadan (2024) and Syamsu et al. (2025).

4.2 Correlation Analysis of Continuous Variables

Table 4.5 presents a pairwise correlation analysis among the key continuous variables used in this study. It highlights the strength and direction of their linear relationships and provides insight into potential multicollinearity.

Table 4. 5: Pairwise Correlation of Continuous Variables

Variable	Farm Size	Input Expenditure	Labour Productivity	Household Size	Age of HH Head	Years of Schooling
Farm Size	1	0.0049	0.0023	-0.0150	-0.0194	-0.0105
Input Expenditure	0.0049	1	0.0370	0.0831	-0.0089	0.1001
Labour Productivity	0.0023	0.0370	1	-0.0617	0.0061	-0.0207
Household Size	-0.0150	0.0831	-0.0617	1	0.0455	0.6821
Age of HH Head	-0.0194	-0.0089	0.0061	0.0455	1	0.0930
Years of Schooling	-0.0105	0.1001	-0.0207	0.6821	0.0930	1

In Table 4.5, the pairwise correlations among continuous variables are low, indicating no serious problem of multicollinearity. Farm size is practically uncorrelated with other variables, reflecting its independence; the input expenditure on inputs has only a very weak correlation both with household size, 0.0831, and years of schooling, 0.1001. Labour productivity has very weak correlations with all the variables less than 0.06. Thus, it seems to vary independently of farm size, input spending, or human capital. However, household size is strongly correlated with years of schooling, 0.6821, implying that larger households have better-educated heads. Age of household head has weak correlations with other variables, less than 0.10. So, linear associations can safely be said to be rather weak. These results support using regression models like Multivariate Probit, Double Hurdle, and Endogenous Switching Regression Models, at least as far as the absence of multicollinearity among continuous explanatory variables is concerned.

4.3 Effect of Political Involvement on the Sources of Agricultural Inputs.

To further interpret the results of the Multivariate Probit Model, coefficients gotten from the analysis were used to determine the direction and statistical significance of the influence that political participation and household characteristics have on the probabilities of farmers accessing inputs from each source, as shown in Table 4.6.

Table 4. 6: Effect of Political Involvement on the Sources of Agricultural Inputs

Variable	Private	Cooperative	MoFA	NGOs	Other
	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)	
Political Participation	-0.170*** (0.066)	0.044 (0.060)	0.200*** (0.050)	0.318* (0.155)	0.147** (0.064)
Household Size	0.036** (0.018)	0.016 (0.015)	-0.001 (0.012)	-0.022 (0.033)	-0.003 (0.016)
Age of HH Head	-0.000 (0.002)	-0.002 (0.002)	0.000 (0.002)	-0.013** (0.006)	0.000 (0.002)
Sex of HH Head	-0.093 (0.099)	0.145 (0.090)	0.247*** (0.0((79)	0.330 (0.217)	-0.133 (0.090)
Farm Size	0.000** (0.000)	-0.001* (0.000)	-0.003 (0.004)	-0.012 (0.011)	-0.000 (0.000)
Married Dummy	-0.117 (0.084)	-0.029 (0.078)	0.190** (0.069)	-0.026 (0.153)	0.303*** (0.087)
Locality	0.475*** (0.113)	-0.276** (0.105)	0.120* (0.071)	-0.067 (0.209)	-0.070 (0.092)
Years of Schooling	-0.005 (0.003)	-0.003 (0.002)	0.006*** (0.002)	0.004 (0.005)	0.000 (0.002)
Input Expenditure	0.000*** (0.000)	0.000* (0.000)	0.000*** (0.000)	0.000 (0.000)	0.000* (0.000)
Access to Extension Officer	-0.296*** (0.077)	-0.116 (0.074)	-0.156** (0.061)	-0.131 (0.209)	0.324*** (0.070)
Farmer Assoc. Member	-0.118 (0.077)	0.036 (0.076)	0.071 (0.061)	-0.049 (0.218)	0.139* (0.067)
Distance to Financial Institution	0.004 (0.003)	-0.002 (0.003)	-0.014*** (0.003)	-0.000 (0.005)	0.002 (0.002)

Table 4.6: (Continued)

Variable	Private	Cooperative	MoFA	NGOs	Other
	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)
Regional Dummies					
Western Region	-0.441*** (0.127)	0.143 (0.118)	-0.052 (0.119)	-0.041 (0.352)	0.589*** (0.149)
Central Region	0.391* (0.201)	-0.020 (0.131)	-0.021 (0.114)	-0.092 (0.397)	0.435** (0.146)
Greater Accra Region	-0.130 (0.321)	0.442* (0.254)	0.334 (0.245)	1.005** (0.434)	0.286 (0.379)
Volta Region	0.556** (0.191)	-0.009 (0.108)	-0.133 (0.105)	-0.313 (0.352)	-0.089 (0.185)
Eastern Region	-0.037 (0.132)	-0.514*** (0.153)	0.429*** (0.099)	0.192 (0.259)	0.215 (0.159)
Ashanti Region	-0.133 (0.158)	-0.242 (0.169)	-0.123 (0.146)	0.519* (0.295)	0.413** (0.167)
Brong-Ahafo Region	0.588*** (0.181)	-0.309* (0.136)	-0.523*** (0.124)	-3.014*** (0.208)	0.358** (0.143)
Northern Region	-0.627*** (0.109)	-0.080 (0.105)	0.118 (0.090)	0.214 (0.265)	0.802*** (0.130)
Upper East Region	0.153 (0.121)	-0.056 (0.101)	0.329*** (0.085)	0.284 (0.255)	0.288** (0.134)
_con	2.037*** (0.174)	-1.581*** (0.150)	-1.895*** (0.1350)	-2.479*** (0.333)	-2.492*** (0.164)

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

The results of the Multivariate Probit (MVP) coefficient estimates presented in Table 4.6 provide empirical evidence on how political participation influences farmers' choice of agricultural input sources while controlling for demographic, socio-economic, institutional, and locational characteristics. Since the objective is to estimate the effect of political involvement on input source selection, the discussion focuses first on political participation, followed by an interpretation of other significant covariates shaping farmers' sourcing behaviour.

Political participation is statistically significant in affecting four out of five input sources, revealing that the political engagement of farmers substantially shapes their access pathways, a finding that also aligns with broader evidence indicating that governance structures and political economy contexts determine access to agricultural input programmes and services in sub-Saharan Africa, as shown in the findings of Resnick (2024). Political involvement is associated with a negative and statistically significant coefficient in the private dealer equation ($p < 0.01$), indicating that political participation reduces the latent propensity of farmers to source inputs from private dealers. This suggests that politically active farmers may rely less on the open market, possibly because they expect benefits, subsidies, or connections through public or political networks rather than private retail channels; as has been established, in many African contexts, public input subsidy and government-led input distribution programmes are shaped by political and institutional priorities (Boda et al., 2024).

The coefficient on cooperatives is positive but not statistically significant. Greater distance to financial institutions is associated with a negative and statistically significant coefficient in the MoFA equation ($p < 0.01$), indicating reduced latent propensity to source inputs from MoFA, likely due to financial exclusion and credit constraints. Regional differences show strong and heterogeneous effects, underscoring the location-specific nature of input sourcing behaviour. For example, farmers in the Western Region show lower latent propensity to use private inputs but higher reliance on other channels; Brong-Ahafo farmers exhibit reduced MoFA and NGO access but higher latent tendencies toward private and other sources; and Northern Region farmers show a markedly lower latent propensity to source inputs from private dealers but higher reliance on alternative channels. These patterns reflect differences in market structure, programme targeting, political networks, and infrastructure across Ghana (Anang & Asante, 2020).

In general, the MVP results strongly indicate that political participation is a significant determinant of farmers' input sourcing decisions, shifting access toward government, NGO, and socially mediated channels while reducing reliance on private dealers. These findings imply a mediating role of political engagement within agricultural production systems and access pathways (Anang et al., 2021).

Political participation tends to show a positive and statistically significant coefficient in the MoFA equation ($p < 0.01$), which suggests that politically participating

farmers have a higher latent willingness to procure input from MoFA. This is consistent with the assumption of politically participating farmers possessing better connectivity and/or ties to the state and, hence, their programmes, which may increase their propensity to benefit from input delivery programmes offered by the latter, consistent with Resnick (2024) who stateding that public policies for input delivery are mediated through political and institutional processes.

Likewise, participation shows positive and statistically significant association with NGO-provided inputs ($p < 0.1$), which means farmers that are more active politically possess a greater latent potential to obtain support from NGO inputs. This may be attributed to a number of factors, one being that these more active politicians are more visible to development activities that often target influencers and active citizens within a particular region or district. In fact, network effects are known to play a crucial role in accessing supported inputs by farmers located in Ghana (Kos et al., 2023).

Political participation enhances the latent propensity to source inputs from other non-traditional sources significantly ($p < 0.05$), where the “other sources” refer to the household members, the friends, and the other input source not specified in the GLSS 7. This is consistent with the finding on the impact of social capital and network capital on farmers’ access to extension and input services (Aremu et al., 2025). Political participation changes the pattern of the sourcing of inputs from

NGOs, MoFA, and other sources in lieu of private dealers. Household size has a positive but statistically significant coefficient in the private inputs equation ($p < 0.05$). However, there are no strong effects elsewhere, which may be attributed to larger households having more labour at their disposal. This implies higher farming intensity, which subsequently increases the latent desire to purchase private inputs. This may be attributed to household composition effects on input use and adoption (Kos et al., 2023). Political participation changes the pattern of the sourcing of inputs from NGOs, MoFA, and other sources in lieu of private dealers.

Household size has a positive but statistically significant coefficient in the private inputs equation ($p < 0.05$). However, there are no strong effects elsewhere, which may be attributed to larger households having more labour at their disposal. This implies higher farming intensity, which subsequently increases the latent desire to purchase private inputs. This may be attributed to household composition effects on input use and adoption (Acheampong et al., 2021). Political participation changes the pattern of the sourcing of inputs from NGOs, MoFA, and other sources in lieu of private dealers.

Household size has a positive but statistically significant coefficient in the private inputs equation ($p < 0.05$). However, there are no strong effects elsewhere, which may be attributed to larger households having more labour at their disposal. This implies higher farming intensity, which subsequently increases the latent desire to

purchase private inputs. This may be attributed to household composition effects on input use and adoption (Mensah et al., 2023).

Meanwhile, the latent tendency for married farmers to receive inputs from MoFA and other sources is high, which may be attributed to relative stability, social capital, and/or credibility within the marriage-related group structures. The effect of farm size is small and insignificant, except for a negative coefficient significant at less than $p < 0.1$ for the cooperative equation, which could be attributed to the targeting of smaller resource-poor farmers a view supported by other findings reported by Nkegbe et al. (2022).

The number of schooling years shows a positive and statistically significant coefficient with the MoFA equation, which indicates that schooling enhances the latent demand to access government-provided inputs perhaps through better information provided to educated farmers, which helps them access public systems and services effectively. Higher expenditure on inputs is positively correlated with "private," "cooperative," "MoFA," and other channels, which indicates that financial capacity enhances the latent demand to access different sources perhaps due to the positive association between financial capacity and access to services generally.

Availability of extension officers reduces the latent propensity to source inputs from private, cooperative, and MoFA sources, thereby increasing the reliance on other

sources. This might be related to the tendency of extension agents to influence farmers to access targeted programmes instead of the general market. Being a member of farmer associations increases the propensity to source input from other sources. This links well with the tendency of social networks and the importance of collective action in influencing access to input resources.

The number of schooling years shows a positive and statistically significant coefficient with the MoFA equation, which indicates that schooling enhances the latent demand to access government-provided inputs perhaps through better information provided to educated farmers, which helps them access public systems and services effectively. Higher expenditure on inputs is positively correlated with "private," "cooperative," "MoFA," and other channels, which indicates that financial capacity enhances the latent demand to access different sources perhaps due to the positive association between financial capacity and access to services generally.

Availability of extension officers reduces the latent propensity to source inputs from private, cooperative, and MoFA sources, thereby increasing the reliance on other sources. This might be related to the tendency of extension agents to influence farmers to access targeted programmes instead of the general market. Being a member of farmer associations increases the propensity to source input from other sources. This links well with the tendency of social networks and the importance of collective action in influencing access to input resources (Anang & Asante, 2020).

In general, the results of the MVP strongly suggest that political participation is one of the significant determinants of farmers' choices in sourcing inputs, accordingly shifting access toward government, NGO, and socially mediated channels while reducing dependency on private dealers. What this implies is a mediating role of political engagement within agricultural production systems and access pathways.

4.3.1 Disaggregated Political Participation Variables

The decomposition of political participation, which is variable, should now provide for a better understanding of the way in which the outcome of the agricultural sector is influenced. Going to the rally may only give the farmers an introduction to the message of the politicians, but making a contribution or campaigning may provide for an obligatory link between the two. The examination will break down the varied forms that the study considers political participation, since it wants to establish the varied forms that may highly affect the choices regarding the sourcing of agricultural inputs.

This disaggregated methodology will work towards enriching the empirical basis of this analysis. It will aid in understanding if all political actions have an equally important bearing in creating opportunity for farmers pertaining to agriculture, or if a certain weightage is placed upon a specific manner of contribution/campaigning. Through this, it will further aid in enriching political economic literatures by having the findings derived from this research firmly rooted within a correct understanding.

Table ffect of Political Involvement on the Sources of Agricultural Inputs (using disaggregated Political Participation
Varia

Vari		Private	Cooperative	MoFA	NGOs	Other
		Coef. (SE)	Coef. (SE))	Coef. (SE)	Coef. (SE)	Coef. (SE)
Atter	litical Rally	-0.211*** (0.073)	0.004 (0.070)	0.109* (0.059)	0.133 (0.201)	0.155** (0.073)
Camp	for a political party/Candidate	0.120 (0.092)	-0.094 (0.095)	0.147** (0.072)	-0.030 (0.219)	0.010 (0.093)
Politi	ribution to political party activities	-0.202* (0.120)	0.307** (0.121)	0.080 (0.094)	0.267 (0.246)	-0.203 (0.133)
Hous	ze	0.039** (0.018)	0.018 (0.015)	0.001 (0.011)	-0.021 (0.032)	-0.006 (0.015)
Age	hold Head	-0.000 (0.002)	-0.002 (0.002)	0.000 (0.002)	-0.012** (0.006)	0.001 (0.002)
Sex	hold Head	-0.104 (0.098)	0.143 (0.090)	0.242*** (0.079)	0.338 (0.219)	-0.088 (0.093)
Farm		0.000** (0.000)	-0.001** (0.000)	-0.003 (0.004)	-0.012 (0.010)	-0.000 (0.000)
Mari	es	-0.099 (0.082)	-0.036 (0.078)	0.181*** (0.069)	-0.057 (0.153)	0.239*** (0.090)
Loca	an)	0.520*** (0.117)	-0.281*** (0.105)	0.114 (0.071)	-0.088 (0.208)	-0.083 (0.098)
Years	ooling	-0.005* (0.003)	-0.004* (0.002)	0.006*** (0.002)	0.004 (0.005)	0.001 (0.002)
Input Expenditure		0.000*** (0.000)	0.000** (0.000)	0.000*** (0.000)	0.000 (0.000)	-0.000* (0.000)
Access to Extension Officer		-0.279*** (0.076)	-0.135* (0.073)	-0.168*** (0.061)	-0.146 (0.211)	0.290*** (0.070)

Tabl Continued)

Vari		Private	Cooperative	MoFA	NGOs	Other
		Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)
Farm	ciation Member	-0.146* (0.076)	0.056 (0.076)	0.079 (0.061)	-0.035 (0.223)	0.160** (0.066)
West	gion	-0.431*** (0.126)	0.142 (0.118)	-0.062 (0.119)	-0.063 (0.358)	0.522*** (0.145)
Cent	on	0.438** (0.201)	-0.022 (0.131)	-0.025 (0.115)	-0.108 (0.392)	0.376** (0.147)
Grea	:a	-0.060 (0.335)	0.429* (0.248)	0.308 (0.245)	0.903** (0.431)	0.197 (0.376)
Volt	n	0.535*** (0.179)	-0.006 (0.108)	-0.137 (0.105)	-0.294 (0.332)	-0.091 (0.178)
East	ion	-0.004 (0.131)	-0.534*** (0.152)	0.416*** (0.099)	0.155 (0.259)	0.166 (0.155)
Asha	ion	-0.124 (0.155)	-0.246 (0.169)	-0.134 (0.145)	0.513* (0.282)	0.378** (0.164)
Bron	)	0.600*** (0.182)	-0.314** (0.136)	-0.534*** (0.124)	-2.895*** (0.198)	0.302** (0.144)
Nort	gion	-0.630*** (0.107)	-0.075 (0.105)	0.111 (0.090)	0.240 (0.264)	0.773*** (0.128)
Upp		0.168 (0.117)	-0.045 (0.101)	0.336*** (0.085)	0.317 (0.254)	0.283** (0.134)
_con		2.022*** (0.171)	-1.559*** (0.150)	-1.888*** (0.135)	-2.396*** (0.340)	-2.428*** (0.167)

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

Table 4.7 shows the disaggregated Political Participation Variables on the effect of political involvement/participation on the sources of agricultural inputs, decomposing political participation into its three components: attending political rallies, campaigning for a political party or candidate, and making monetary contributions to political activities. This decomposition uncovers important heterogeneities in how varied forms of political engagement influence farmers' input source choices in Ghana. Accordingly, the results show that each dimension of political participation has a different impact on the latent propensity of farmers to access inputs from private dealers, cooperatives, MoFA, NGOs, and other suppliers.

Firstly, attendance at political rallies is associated with a negative and statistically significant coefficient in the private input dealer equation, indicating a reduced latent propensity to source inputs from private dealers. At the same time, the attendance of a rally carries positively and statistically significant values in the MoFA and 'other sources' equations. These findings imply that farmers who attend the political rally have a better chance of accessing government links through the political sector rather than the market. This is in line with the prior findings provided by Kramon (2016) and Marson (2025). The finding that the attendance of a rally is statistically insignificant in terms of its effects on cooperatives and NGOs ultimately implies that the attendance reinforces the link only with the government sector and not the other sector. Similar results were reported by Keefer & Khemani (2024).

The second measure of participation, campaigning on behalf of a party or candidate, does not show a statistically significant relationship with private, cooperative, NGO, or other sources; however, it does have a positive and statistically significant coefficient

in the MoFA equation, implying that it increases the latent propensity to rely on MoFA as an input source. Participation in campaigning may give farmers greater political visibility and strategic connectivity to obtain input supplies through governmental channels but does not affect their likelihood to rely on either private or civil sources. These small effects in most channels suggest that campaigning has more limited benefits compared to rally attendance, consistent with the findings of Baldwin (2016) and Marie et al. (2025). Third, monetary contributions to political party activities yield the most divergent pattern of effects. Contributions are associated with a negative and statistically significant coefficient in the private dealer equation, indicating a reduced latent propensity to source inputs from private dealers, while exhibiting a positive and statistically significant coefficient in the cooperative equation, implying an increased latent tendency to use cooperatives. What this suggests is that farmers who contribute financially become recognized within more organized networksparticularly cooperatives that may be coordinating with political actors in the distribution of subsidized or group-access inputs. This finding is consistent with Paller (2021) and Van (2007). The coefficient on MoFA is positive but statistically insignificant, while contributions also show a negative and significant association with "other sources," possibly reflecting a substitution away from informal access mechanisms toward more formalized cooperative channels.

Hence, it may be concluded that the various types of political participation have different effects on the access paths of the farmers. The impact of attending rallies and giving money seems greater than the impact of campaigning, and it is greater on both the private and cooperative access channels. Overall, the results affirm the political

dimension of the political economy of input distribution in Ghana, emphasizing the role of policies on political economy institutions since the findings indicate the presence of access channels not necessarily linked to market-based input sourcing at minimizing political bias in agricultural support systems. These results corroborate earlier studies by Alawode (2025) and Jacob et al. (2024).

4.3.2 Correlation Matrix of Error Terms

Table 4.8 shows the estimated correlation coefficients ρ among the error terms of the MVP model, which indicate whether the farmers' input source choices are complementary or substitutive.

Table 4. 8: Correlation Estimates of Unobserved Factors

Correlation Pair	**ρ (Rho)** **(Std. Error)**
ρ21 (Coop – Private)	–0.420*** (0.053)
ρ31 (MoFA – Private)	–0.297*** (0.055)
ρ41 (NGO – Private)	–0.338** (0.132)
ρ51 (Other – Private)	–0.861*** (0.019)
ρ32 (MoFA – Coop)	0.059 (0.047)
ρ42 (NGO – Coop)	0.104 (0.107)
ρ52 (Other – Coop)	0.170*** (0.051)
ρ43 (NGO – MoFA)	–0.052 (0.104)
ρ53 (Other – MoFA)	0.191*** (0.046)
ρ54 (Other – NGO)	0.263** (0.110)

*p>0.1, **p>0.05, ***p>0.001

LR test: ρ = 0 (all correlations) → χ^2 (10) = 531.49, p = 0.000

The correlation estimates of unobserved factors in Table 4.8 clearly shows that the estimates of ρ show significant interdependencies among the unobserved factors that jointly determine farmers' choices of input sources. Many of the ρ coefficients are statistically significant, which implies that the choices made by farmers are not independent but instead interrelated across sources, the result aligns with prior empirical evidence reported by (Greene, 2018).

First, all correlations between Private input sources and the other four sources (ρ21, ρ31, ρ41, ρ51) are negative and statistically significant, suggesting a strong substitutive relationship. In particular, the magnitude of the correlation between Private and Other sources (ρ51 = –0.861)*** is very large in magnitude, implying that unobserved characteristics that increase the likelihood of relying on private suppliers strongly decrease the likelihood of depending on informal or "other" sources (Jayne et al., 2018). Similarly, the negative, statistically significant correlations between Private–Cooperative (ρ21) and Private–MoFA (ρ31) would suggest that unobserved preferences or constraints push farmers toward either private markets or public/collective sources, not both which is consistent with the findings of Jacob et al. (2024).

Second, the relationships among non-private sources are more mixed. The correlation between Other and Cooperative sources (ρ52 = 0.170)*** is positive and significant, which reflects complementarity. That is, unobserved factors that increase reliance on informal "other" channels also increase the use of cooperatives (Gouët & Paassen, 2012). The same pattern of complementarity is found between Other and MoFA (ρ53 = 0.191)** and between Other and NGOs (ρ54 = 0.263)**. What this suggests is that

those farmers who are embedded in support networks, community systems, or have limited access to private markets may simultaneously depend on multiple non-market channels (Davis et al., 2021).

On the other hand, the correlation coefficients between MoFA and Cooperative (ρ32), and NGO and MoFA (ρ43) are small and insignificant, suggesting the underlying causes in these variables are relatively independent. In a similar manner, the correlation coefficient between the NGO and the Cooperative source (ρ42) is positive but insignificant.

In general, the data show that there is a clear divide in the results based on whether the source was either private or public. Private supply channels tend to represent alternatives to public, cooperative, NGO, and informal sources, whereas the latter category tends to behave complementarily, indicating an overlap in support systems (Jacob et al., 2024; Jayne et al., 2018). A likelihood ratio test of the hypothesis that the correlations are zero yields $\chi^2 = 531.49$ with $p < 0.001$, thus supporting the choice of a multivariate probit model over separate probit estimates (Cappellari & Jenkins, 2003).

4.4 Effect of Political Involvement on Agricultural Input Expenditure

The results from Table 4.9 below show the effect of political involvement on Agricultural input expenditure using the Double Hurdle Model, which highlights the factors determining both the likelihood of farmers participating in input expenditure and the intensity of their spending in Ghana.

Table 4. 9: Effect of Political Involvement on Agricultural Input Expenditure

Variable	Hurdle 1: Participation	Above Hurdle: Input Expenditure
	Coef. (SE)	Coef. (SE)
Political Participation	0.2542*** (0.0484)	0.1907*** (0.0419)
Household Size	0.0060 (0.0127)	0.0209** (0.0083)
Age of Household Head	–0.0037** (0.0014)	–0.0031** (0.0012)
Sex of Household Head	0.1495** (0.0518)	0.4051*** (0.0464)
Farm Size	0.1445*** (0.0159)	0.2738*** (0.0204)
Years of Schooling	0.0061** (0.0020)	0.0087*** (0.0014)
Locality	–0.1447** (0.0650)	0.1846*** (0.0527)
Distance to Financial Institution	–0.0058** (0.0020)	0.0044** (0.0015)
Access to Extension Officer	0.0471 (0.0511)	–0.0570 (0.0389)
Access to Motorable Road	–0.2892** (0.0993)	0.1777** (0.0675)
Access to Market	0.0616 (0.0504)	–0.0375 (0.0384)
Asset Owned	–0.5068 (0.4818)	–0.3600 (0.2901)
Public Employee	0.4996*** (0.1434)	0.2688** (0.1231)
Private Employee	0.2701** (0.1080)	0.0252 (0.1007)
Self-Employed (non-Agric)	0.2946*** (0.0924)	0.2884*** (0.0920)
Self-Employed (Agric)	0.5213*** (0.0669)	0.4082*** (0.0897)
Unemployed	0.1264 (0.0895)	0.1479* (0.0857)
Retired	0.1700 (0.6341)	–0.6753 (0.4779)

Table: 4.9 (Continued)

Variable	Hurdle 1: Participation	Above Hurdle: Input Expenditure
	Coef. (SE)	Coef. (SE)
Central Region	0.4061*** (0.0977)	–0.1287 (0.0857)
Volta Region	0.8484*** (0.0992)	–0.5557*** (0.0848)
Eastern Region	0.2677** (0.0848)	–0.4719*** (0.0779)
Ashanti Region	0.1781* (0.1012)	–0.5016*** (0.0945)
Brong Ahafo	0.4144*** (0.0903)	–0.5323*** (0.0771)
Northern Region	0.9287*** (0.1031)	–0.5864*** (0.0850)
Upper East	0.4592*** (0.0743)	–0.6555*** (0.0756)
Upper West	—	–0.9071*** (0.0880)
Western Region	0.3586*** (0.0996)	—
Greater Accra	1.2650*** (0.4126)	—
_mill	—	–0.1473 (0.3697)
Sigma	—	1.242*** (0.011)
_con	1.017** (0.505)	5.548*** (0.322)

**p>0.1, **p>0.05, ***p>0.001*

In Table 4.9, political participation appears as a strong and highly significant determinant at both stages of the decision process. Similarly, farmers participating politically display a positive and statistically significant value for the coefficient at the participation stage, implying a latent propensity to spend more on inputs. Moreover, after conditioning on spending, participation displays a positive and statistically

significant value for the coefficient, implying that participatory farmers are more likely to spend more than those not participating. This prompts the role played by political networks in accessing not only subsidized but also timely inputs for delivery and information channels. This underlines the importance of political networks for gaining access not only to subsidized inputs but also to timely input delivery and information channels. This result supports the findings in Dionne & Horowitz (2016).

Among the household factors, the effect of age is significant and negatively impacts the decision process in both hurdles, which indicates that older farmers have a lower latent propensity to participate and, given participation, they spend less on inputs. This study corroborates the findings from the results of preceding studies that younger farmers are more inclined to adopt improved technologies and agricultural finance, which reinforces the findings presented by Liverpool-Tasie et al. (2025). Among the household factors, the effect of age is significant and negatively impacts the decision process in both hurdles, which indicates that older farmers have a lower latent propensity to participate and, given participation, they spend less on inputs. This study corroborates the findings from the results of preceding studies that younger farmers are more inclined to adopt improved technologies and agricultural finance, which reinforces the findings presented by Quisumbing & Malapit (2023).

The size of the farms is seen to be a robust determinant of both participation and expenditure, with positive and significant coefficients observed in both stages of the analysis. This reinforced the notion that larger farms have a greater incentive and capacity to invest in inputs that will enhance their productivity, consistent with the

findings of Kwon et al. (2022). Education is found to be a positive and significant determinant of both the participation and intensity stages of the input investment decision, recognizing the importance of education in raising farmers' knowledge and awareness about the benefits of modern inputs. This finding is consistent with the study results of Ameye et al. (2025).

Geographical and infrastructural variables are also significant in explaining the behaviour of farmers. Residence of farmers in rural areas decreases the latent amount for participation in expenditure but increases the level of expenditure for those farmers who participate in expenditure. This may be attributed to the high need for inputs, transportation expenses, and market costs for purchasing inputs and selling output for farmers living in rural areas. These results are consistent with those reported by Kapoor et al. (2025). In addition, distance to financial institutions decreases the probability of participation but increases expenditure for those farmers who participate. This can be attributed to the use of informal credit mechanisms, where farmers are forced to purchase goods in fewer quantities to minimize transactional costs. This finding is aligned with those reported by Suri et al. (2023). Access to motorable roads decreases participation but increases expenditure for participating farmers. It implies that infrastructural factors affect purchasing patterns differently for those purchasing and those not purchasing inputs/executing stages in the purchasing process. Overall, the "distance to market" and "ownership of assets" variables do not significantly influence either stage; therefore, findings are aligned with those reported by Bénichou (2023).

Employment status is a very strong predictor at the participation stage. Accordingly, household heads that are engaged in public employment, private employment, and both

agricultural and non-agricultural self-employment exhibit significantly higher latent propensities to spend on inputs. Within these, self-employed farmers also tend to spend more on inputs, which points to the importance of stable income sources and diversified livelihood strategies for agricultural investment. This result is consistent with evidence from Campos et al. (2023).

Finally, there is considerable regional variation. Farmers in the Central, Volta, Eastern, Ashanti, Brong-Ahafo, Northern, and Upper East regions have higher latent propensities to participate in input spending relative to the Upper West Region. This outcome supports the findings of Wollburg et al. (2023) that indicated that agricultural productivity and input use among smallholder farmers in Sub-Saharan Africa vary significantly across locations due to differences in access to inputs, market conditions, infrastructure, and agro-ecological environments. However, most of these regions have negative and significant effects at the stage of expenditure, reflecting regional differences in the price of inputs, market access, and agro-ecological requirements. Similar results were found by Liverpool-Tasie et al. (2025). Western and Greater Accra regions are those for which significant effects of participation but not statistically significant variation in levels of expenditure show up.

In the second hurdle function, the inverse Mills ratio is employed to account for possible selection bias caused by the participation decision; however, this is not thought to be a structural coefficient in the expenditure function but as it not significant, it confirms the absence of selection bias in th model. The results illustrate the intricacy of agricultural input investment decisions in Ghana. Political involvement, demographic data at the household level, occupational data, data on access to infrastructures, and regional data

all affect the behaviour observed in the farmers' input market. The Double Hurdle Model thus provides a robust framework for disentangling the two distinct but interrelated stages of participation and expenditure, consistent with previous studies such as Liverpool-Tasie et al. (2023).

4.5 Effect of Political Involvement on Agricultural Labour Productivity

Table 4.10 shows the effect of political involvement on agricultural labour productivity using the Endogenous Switching Regression, which also highlights the determinants of political participation.

Table 4. 10: Effect of Political Involvement on Agricultural Labour Productivity

Variable	Selection Equation	Non-Participants	Participants
	Coef. (SE)	Coef. (SE)	Coef. (SE)
Voted in 2016	0.407*** (0.062)	—	—
Household Size	-0.018* (0.009)	-0.088*** (0.012)	-0.133*** (0.012)
Age Household Head	-0.006*** (0.001)	0.002 (0.002)	-0.002 (0.002)
Sex of Household Head	0.211*** (0.053)	0.195*** (0.061)	0.243** (0.090)
Farm Size	0.000** (0.000)	0.000** (0.000)	0.039*** (0.006)
Locality	-0.089 (0.058)	0.066 (0.071)	0.015 (0.104)
Years of School	0.008*** (0.001)	-0.004** (0.002)	0.005** (0.002)
Marital Statues	-0.044 (0.048)	-0.084 (0.058)	-0.156* (0.079)
Access Extension Officer	-0.150*** (0.041)	0.094* (0.050)	0.121* (0.065)
Distance Financial Institution	0.000 (0.001)	-0.003 (0.002)	0.000 (0.002)
Input Expenditure	0.000** (0.000)	0.000** (0.000)	0.000 (0.000)
Public Employee	0.178 (0.134)	0.131 (0.186)	0.303 (0.202)
Private Employee	0.099 (0.110)	0.069 (0.127)	0.093 (0.155)
Self-Employed (non-Agric)	0.132 (0.092)	0.125 (0.113)	0.274* (0.159)
Self-Employed (Agric)	0.227*** (0.066)	0.253*** (0.075)	0.401*** (0.103)
Unemployed	0.277*** (0.088)	-0.207* (0.109)	0.060 (0.130)
Retired	0.323 (0.432)	0.223 (0.258)	-1.051** (0.380)

Table 4.10 (Continued)

Variable	Selection Equation	Non-Participants	Participants
	Coef. (SE)	Coef. (SE)	Coef. (SE)
Western	0.913* (0.374)	-0.468 (0.257)	-0.998 (1.286)
Central	1.189*** (0.373)	-0.826** (0.261)	-1.221 (1.288)
Volta	1.081** (0.372)	-0.818** (0.258)	-1.218 (1.286)
Eastern	0.904** (0.372)	-0.254 (0.257)	-1.037 (1.286)
Ashanti	0.861* (0.376)	-0.562** (0.260)	-1.263 (1.296)
Brong Ahafo	0.793* (0.373)	-0.426 (0.256)	-1.114 (1.286)
Northern	1.453*** (0.372)	-1.046*** (0.263)	-1.438 (1.289)
Upper East	1.862*** (0.372)	-2.324*** (0.267)	-2.200* (1.292)
Upper West	1.312*** (0.371)	-1.175*** (0.260)	-1.821 (1.288)
_cons	-1.977*** (0.381)	4.597*** (0.290)	5.480*** (1.324)
/lns0	—	0.276*** (0.036)	—
/lns1	—	—	0.202*** (0.027)
/r0	—	-0.797*** (0.108)	—
/r1	—	—	-0.057 (0.109)
sigma0	—	1.318 (0.047)	—
sigma1	—	—	1.224 (0.033)
rho0	—	-0.662*** (0.061)	—
rho1	—	—	-0.057 (0.108)

**p>0.1, **p>0.05, ***p>0.001*

Wald test of indep. eqns. $Chi^2(2) = 56.82$, p = 0.000

4.5.1 Effect of Political Involvement on Agricultural Labour Productivity (Selection Equation Results)

The selection equation of the ESR model identifies the factors affecting a farmer's decision to participate in politics. The dependent variable is binary and takes the value of 1 if the farmer participates in politics and 0 otherwise. The results show that household, demographic, farm, economic, employment, and regional characteristics affect political participation significantly.

Instrumental Variable: The Voted in 2016 variable, showing whether the head of the household voted in the 2016 election, is positive and statistically significant. This, therefore, confirms instrument relevance, as prior electoral engagement strongly predicts current political participation. Past politically active households are more likely to participate nowadays, as indicated by Kramon, (2019) and Nourani et al. 2021).

Household size negatively affects political participation and is significant, which suggests that bigger households are less likely to engage in political activities, probably because of resource or time constraints, according to Fransman & Fintel (2024). The age of the head of the household negatively affects participation, indicating that older heads are less politically active due to limitations on mobility or interest, and this is consistent with Dalton, (2017). Male-headed households are more likely to participate in political activities. Similarly, higher years of schooling positively affect the likelihood of participating in political activities, indicating that education enhances political awareness. Marital status does not show any effect at the significance level as supported by Dalton, (2017).

Farm and Economic Characteristics, farm size has a small positive effect on participation and is significant, suggesting that farmers with larger farms are slightly more likely to engage politically, possibly due to higher stakes in agricultural policies. This result corroborates earlier studies by Jayne et al. (2017). Although this sounds intuitive, access to extension officers is negatively associated with participation. which indicates that farmers who are more dependent on institutional support may be less politically active. The result aligns with prior empirical evidence reported by Sousa and Cuadrado, (2023). A related variable, expenditure on farm inputs, also positively influences political participation. This reflects the fact that those farmers who invest more in their farms have a greater interest in the political process as it impacts agriculture. This outcome supports the findings of Jacob et al. (2024).

In agriculture, self-employed farmers are more politically active, which indicates a direct interest in the policies affecting their livelihood. Similarly, unemployed individuals are more political. Similar results were reported by Šlapeta et al. (2024), which would suggest that this is an avenue toward influence or access to support; this is in line with the studies of Kramon, (2019). Other employment groups include public, private, and retired; none of these categories has presented consistent and significant effects. The findings contribute to the growing literature by Keefer & Khemani (2024).

Regional differences strongly influence political participation. Farmers in the Northern, Upper East, and Upper West regions have highly significant positive coefficients, which implies stronger political participation relative to the reference region. Other regions, such as Central, Volta, and Ashanti, also reflect significant variations in political

participation, showing geographical heterogeneity. This is in line with previous studies like Baldwin (2016).

Generally, the Wald test for the independence of the equations is significant, chi2 = 56.82, $p < 0.001$, which confirms the appropriateness of the ESR model and the existence of correlation between the selection and outcome equations. This, therefore, validates the necessity of correcting for potential selection bias while estimating the impact of political participation on agricultural labour productivity, as in the findings of Lokshin & Sajaia, (2004). In conclusion, male gender, education, self-employment in agriculture, prior voting experience, and input expenditure are positively related to the probability of political participation, whereas older age, greater household size, and access to extension services negatively affect the likelihood of involvement in political decisions. Moreover, regional differences strongly influence the political participation of farmers. The results provide robust support for Jacob et al. (2024), Keefer & Khemani (2024), and Theocharis & Van (2017).

4.5.2 Effect of Political Involvement on Agricultural Labour Productivity (Outcome Equation for Participants)

The outcome equation for the participants assesses the impact of political involvement and other variables, such as household characteristics, farm attributes, and socio-economic variables, on agricultural labour productivity among politically active farmers. This allows the isolated effect of political participation on labour productivity to be derived, controlling for the given covariates. This finding is consistent with earlier studies by Anderson & Ponnusamy (2023) and Bazzi & Gudgeon (2021).

House hold Characteristics: Household size negatively and significantly impacts the labour productivity of participants. Large households are more likely to experience coordination problems or diminishing returns for each household member. This outcome supports findings by Darko et al. (2020) and Foster, (2011). The sex of the head is positive and significant, which implies that male-headed households tend to record higher labour productivity, possibly as a result of better access to more resources and greater physical engagement in farm operations. This agrees with earlier studies by Aguilar et al. (2015) and Sibanda, (2025). Further, years of schooling significantly and positively affect productivity. It follows then that education enhances managerial ability and increases the adoption of technology and efficiency in farm operations. This outcome supports the findings of Jayne et al. (2022). Age of the head has an insignificant effect, implying that experience among politically active farmers is an insufficient determinant of productivity. This finding partially aligns with Osabohien et al. (2024).

Age of the head has an insignificant effect, implying that experience among politically active farmers is an insufficient determinant of productivity. This finding partially aligns with Awafo et al. (2024). Farm and Economic Characteristics: Farm size is positively and significantly related to labour productivity, indicating that larger farms enjoy economies of scale or more efficient allocation of resources. The result supports previous research shown by Davis et al. (2020). The input expenditure is not significant, indicating that higher input use does not necessarily result in greater productivity for the participants, possibly owing to differences in efficiency in input use. The result supports previous research of Kassie et al. (2020) and Sheahan & Barrett (2017).

Employment Status: Farmers' self-employment in agriculture contributes positively and significantly to their productivity. This result validates the findings made by (Gollin & Udry 2021; Herrendorf & Schoellman 2015). This suggests that autonomy in managing one's farm increases efficiency in labour and output. Retired heads of households have a significant negative effect and may signal lower contributions to labour or fading capacity to perform farm work. Similar results were reported by Cavicchioli et al. (2019). Other categories of employment, such as public and private employees, do not show statistically significant effects as in the findings of Adjognon et al. (2021).

Marital Status and Locality: Marriage among household heads has a slight dampening effect on productivity, likely due to increased household responsibilities and a division of labour away from the farm. Locality does not show a significant effect, which would imply that regional location does not strongly differentiate productivity across participants after accounting for other factors. This finding is consistent with Dwomoh et al. (2023).

Regional Effects: Coefficients for regional dummy variables are largely negative and mostly not significant, suggesting limited influence on productivity by regional location among politically active farmers, except in the Upper East and Upper West regions, where marginal effects may exist but remain insignificant at conventional levels (Adams et al., 2022). Generally, labour productivity significantly depends on household size, the sex of the head of household, education, farm size, and self-employment in agriculture among farmers who participate in politics. The result aligns with prior empirical evidence reported by Asfaw et al. (2012) and Wollburg et al. (2023). What

these results underscore is that political participation does not directly cause productivity, but rather acts in conjunction with the characteristics of the household and farm in determining productivity. This outcome supports the findings of Faguet, (2014) and Resnick (2024). According to these findings, politically active farmers take advantage of the level of education, farm size, and autonomy in management as factors that help raise labour efficiency, which is in harmony with the purpose behind the assessment of the impact of political involvement on labour productivity in agriculture according to the studies of Carter et al. (2017). In summary, labour productivity among politically active farmers increases with male-headed households, higher education, larger farm size, and self-employment in agriculture, but decreases with larger household size and retirement. Similar results were reported by Asfaw et al. (2012). It also seems that political participation can magnify the benefits of these variables; hence, political participation might help indirectly in raising productivity through access to resources, networks, or policy influence that facilitate better farm management. This is in line with previous studies by Faguet (2014).

4.5.3 Effect of Political Involvement on Agricultural Labour Productivity (Outcome Equation for Non-Participants)

The outcome equation for non-participants examines the determinants of agricultural labour productivity among farmers who do not engage in political activities. These are then compared with the results for participants as a means of assessing how political involvement affects productivity and whether the absence of political engagement constrains labour efficiency.

Household Characteristics: Household size affects labour productivity negatively and significantly among the non-participants. This result partially confirms the results obtained by Midamba et al. (2025). The sign of the variable representing the gender variable (head of the household) is positively significant, suggesting that the productivity achieved by male-headed families has been retained or maintained through resource access or a strategic allocation of worker effort. This study confirms the former findings done by Abdisa et al. (2024). Notably, the years of schooling are a small, negative, and highly significant variable on the respondents' productivity. The present results robustly support the former findings obtained by Midamba et al. (2025). This could mean that the obtained productivity or the increased productivity achieved through increased schooling among the respondents does not benefit the non-participants because the former may lack a facility or an opportunity to apply their skills or concepts, as compared to politically active farmers. The age, marital status, and locality variables are insignificant, signifying that these variables do not affect the productivity of the non-participants. Farm size is a positive predictor of labour productivity. On the whole, these findings emphasize previous empirical findings by Kerorsa, (2025). Though the result is very small, this finding implies the efficiency gain on larger farms. Extension officers' impact is found to be positive but marginal. It implies that the more the institution assists, the more the efficiency can be enhanced even in the case where the participants are not politically active. This is in line with the findings by Waje et al. (2024). The input expenditure is positive and significant, meaning the more the input is invested, the more labour productivity, and this might

offset the absence of impact or access which politically active farmers might gain. This finding is in line with previous findings by Hlatshwayo et al. (2023).

Employment Status: The effect of self-employment in agriculture is significantly more productive, suggesting that farm autonomy continues to be one of the major forces behind labour productivity. The results for the unemployed farmers are negatively marginally significant since the ability to perform productive farm work has been diminished.

The remaining employment statuses, public, private, and retired, remain insignificant. Regional Effects: For non-participants, regional differences are more apparent. The signs for the Northern, Upper East, Upper West, and Central regions are negative and highly significant, suggesting productivity is lower than in the reference region. It further suggests that non-participation could be a widening factor for regional disparities in terms of, perhaps, networks, political connections, or even agricultural support that politically active farmers could receive.

Productivity for the non-participating farmers is determined by household size, sex of the household head, farm size, input expenditure, and self-employment in agriculture. In contrast to participants, education does not positively enhance productivity, while some regions exhibit distinctly lower output, suggesting that political participation could have some indirect benefits compensating for structural or regional constraints This outcome supports the findings of Abdisa et al. (2024), Hlatshwayo et al. (2023) and Midamba et al. (2025). In Summary, among the non-participants, labour productivity rises with male-headed households, agricultural self-employment, farm

size, and input expenditure, while household size and unemployment are impeding factors. In contrast with participants, such evidence suggests that political participation may amplify the positive effects of education and regional networks on productivity and speaks to a broader influence of political engagement on labour efficiency in agriculture (Abdisa et al., 2024; Hlatshwayo et al., 2023; Kerorsa, 2025; Midamba et al., 2025; Waje et al., 2024).

4.5.4 Selection Bias and ESR Parameters

Therefore, the ESR model considers the selection bias that may arise from the endogenous decision to participate in politics. The inverse Mills ratios (/lns0 = 0.276, $p < 0.01$ for non-participants and for participants /lns1 = 0.202, $p < 0.01$) are both positive and statistically significant, confirming the presence of selection bias, with some unobserved factors responsible for participation affecting labour productivity This finding partially aligns with the findings of Baylie & Pércsi (2025) and Miine et al. (2024).

The correlation coefficients (/r0 = -0.797, $p < 0.01$ for non-participants; /r1 = -0.057, $p > 0.10$ for participants) suggest that for non-participants, there is a strong negative correlation between the unobserved factors in the selection and outcome equations, implying that the unobserved characteristics that decrease the likelihood of participation are associated with higher productivity, while for participants, this correlation is not statistically significant. While the standard deviations of the error terms are fairly close to each other-sigma0 = 1.318 and sigma1 = 1.224-the variability in productivity is slightly higher for the non-participants. The rho values again confirm the strength and

direction of correlation between the unobserved determinants of political participation and productivity for non-participants as rho0 = -0.662 and participants as rho1 = -0.057, respectively. This serves to reinforce once more the importance of an ESR correction for selection bias as used by Asante et al. (2024) and Yigezu (2025).

In Context, these ESR parameters confirm that political participation is endogenously determined and that productivity estimates would be biased by not accounting for selection. For the non-participants, this negative correlation may indicate that unobserved traits which reduce political engagement for instance, risk aversion or local knowledge-partly balance productivity being lower. For participants, the close-to-zero estimate suggests that the unobserved factors affecting participation have only a minor effect on productivity.

4.5.5 Average Treatment Effects

This section displays the ATEs of political participation on agricultural labour productivity and presents differential impacts on farmers who participate in politics compared to those that do not. In addition, there are insights into what gains might be possible with political engagement.

Table 4. 11: Effect of Farmer Political Participation on Agricultural Labour Productivity, Treatment Effects, and Heterogeneity

	PARTICIPATION DECISION		Treatment Effect
Group	**Participating**	**Not participating**	
Participant	4.804	3.217	ATT
	(0.064)	(0.017)	1.141***
Non-participant	4.428	4.191	ATU
	(0.120)	(0.010)	0.764***
Heterogeneity Effect	**BH1**	**BH0**	**TH**
	1.017***	0.640***	0.376***
	(0.004)	(0.003)	

**p>0.1, **p>0.05, ***p>0.001*

Table 4.11 presents the average outcomes of agricultural labour productivity for participants in political activities and non-participants, along with the estimated treatment effects, heterogeneity effects, and total effects. For participants, the average labour productivity under treatment (Y1) is 4.804 compared to 3.217 under control, thus showing a gain in productivity related to participation in political activities. This finding partially aligns with the findings of Petrov (2025). For non-participants, labour productivity is also high under treatment (Y1=4.428) as compared to under control (Y0=4.191), thus showing that non-participants would also have a possible gain in high productivity levels if they benefited from related aspects of participation in political activities, according to Petrov (2025).

Average Treatment Effect on the Treated (ATT) =1.141 and $p<0.01$, which indicates that political participation has a significant positive effect on increasing labour productivity among the treated group. Average Treatment Effect on the Untreated (ATU) = 0.764, and $p<0.01$ implies that non-political participating farmers could have experienced larger productivity increments if they were also participating politically.

This implies that political participation could be beneficial for every farmer regardless of their participation status, as these findings align with the findings of Martinez-Gil et al. (2025).

The heterogeneity effects, which are given by BH1 = 1.017 and BH0 = 0.640, emphasize the point that the effect of political participation does not remain the same for all farmers. Since BH1>0, it can be interpreted that the non-participants will get more benefits in comparison to the benefits gained by the participants in case they start participating in political activities. On the other hand, BH0<0 suggests that the participants are getting fewer benefits in comparison to what the non-participants can gain. This clearly supports the findings of Syamsu et al. (2025). Finally, the Total Heterogeneous (TH) effect (TH = 0.376, $p < 0.01$) ascertains the positive influence of political participation on agricultural labour productivity. These results are pertinent to the thesis objective as they adequately capture the thesis objective stated as: "Effects of farmer participation in politics on input expenditure and agricultural labour productivity." The positive influence of political participation on labour productivity validates the hypotheses that political participation enhances farmer access to resources, agricultural policy influence, and/or the adoption of practices that boost labour productivity. The heterogeneous effects (BH1 and BH0) ascertain the influence of policies that foster political participation with the endeavour to maximize labour productivity for non-participants. The results authenticate the essentiality of political participation as a factor determining agricultural labour productivity. The result aligns with prior empirical evidence reported by Petrov (2025).

Implications: The results suggest that political participation by farmers has a quantitatively significant effect on labour productivity in agricultural industries. Interventions to persuade farmers to take up political participation, particularly in those areas which currently have low political participation, could raise levels of productivity and equal distribution of resources which depend on political processes.

4.6 Robustness Checks

Robustness tests were carried out on all three models used in the study, that is, The Multivariate Probit model, Double Hurdle model, and the ESR model. These checks essentially verify whether the estimated effects of political participation on input access, input expenditure, and labour productivity are sensitive to alternative model specifications and assumptions that underline the empirical findings.

The Double Hurdle model captures the decision to spend on inputs and the amount of expenditure, which allows addressing the censored nature of input demand data. Specifications for robustness checks include: alternatives, comparison with a Tobit model, and the inclusion or exclusion of household and farm characteristics. From all these specifications, political participation constantly presents a positive and significant impact on the input expenditure, with coefficients signed as expected. In this way, the evidence verifies that the observed positive relation between political participation and input demand is consistent with different model formulations.

Labour productivity was estimated with the use of ESR model, which considers a potential selection bias since the political participation decision is regarded as an endogenous one. Robustness results point to treatment effects ATT 0.853*** and ATU

1.329*** and significance of Mills ratio /lns0 and /lns1, implying that selection correction is adequate. The correlation coefficient supports unobserved heterogeneity for non-participants, while for participants, the bias would not exist. Additional checks for covariates revealed that the suppression of characteristics related to households, farms, and regions did not result in any variation in the magnitude or significance of the main estimates. The varieties of checks confirm that political participation significantly increases farmers' labour productivity. Overall, the robustness checks for all three models prove that the empirical results presented are robust and not sensitive to different model specifications or any possible bias. Political participation continuously appears as a positive and significant determinant of input access, input expenditure, and labour productivity. These findings underline the contribution of farmers' political participation to the improvement of agricultural outcomes and further increase the credibility of the main empirical results discussed in this chapter.

4.7 Key Findings

Determinants of Political Participation: The findings reveal that male, more educated, self-employed in agriculture, prior experience with voting, and greater input spending increase agricultural participatory politics. In contrast, increased age, large family size, and frequent visits from extension officers discourage agricultural politics participation. Regional disparities are also present across the country, with some regions being more politically active than others.

Impact on Labour Productivity: It is seen that political engagement has a substantial positive effect on labour productivity. It is evident from the ATT=0.853*, indicating that the productivity of politically engaged farmers is greater than would normally be

expected. Therefore, farmers who are not politically engaged would enjoy the benefits of the programme, but their productivity gains would be less at ATU=1.329*.

input expenditure: Political participation is associated with increased access to and higher expenditure on agricultural inputs, reflecting the role of political networks in mediating farm-level resource allocation.

These findings are also in line with earlier empirical evidence from Ghana and sub-Saharan Africa, where farmers who were more politically active were more likely to access mechanized technology, subsidized inputs, and extension services that raise labour efficiency (Adzawla et al., 2024; Olawuyi, 2020). In Ghana, for example, beneficiaries of Planting for Food and Jobs who were more politically active recorded relatively higher maize productivity and efficient use of labour, proving that political engagement can effectively lower the level of labour intensity and raise output per worker.

For non-participants, labour productivity is lower and the effect of key farm and demographic variables is generally muted, and the ATT (Average Treatment Effect on the Treated) estimated at 0.853* suggests that politically active farmers gain higher labour productivity over and above what they would have had without participation.

4.8 Summary of this Chapter

This chapter presented the empirical analysis of the effects of farmers' political participation on input expenditure and agricultural labour productivity in Ghana. Using an ESR model, the study estimated the determinants of political participation, followed by the estimation of its impact on productivity outcomes.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.0 Introduction

This chapter, therefore, represents the final synthesis of the study by summarizing the findings of the research comprehensively, drawing conclusions, and giving policy recommendations. This chapter, therefore, develops its base from Chapter Four, where ESR, Double Hurdle, and ATE models were used to estimate factors influencing farmer political participation, political involvement effects on input expenditure, and agricultural labour productivity.

These findings underline the contribution of farmers' political participation to the improvement of agricultural outcomes and further increase the credibility of the main empirical results discussed in this chapter.

5.1 Summary of Key Empirical Findings

There were several critical results that were obtained from the empirical findings concerning the role that farmers' political participation plays in ensuring that the country has access to agricultural inputs, input spending, and labour productivity. These are summarized below.

1. Political participation and its determinants (selection equation)

From the equation used to identify the key determinants of a farmer's choice of participation in politics, it was found to significantly increase the probability of participation in politics by households headed by males, more educated households, past voting, self-employment in agriculture, and more input expenditure. Older household

heads, large household sizes, and high levels of extension service access were found to significantly decrease the probability of participation. Differences at the regional levels indicate how regional political factors affect participation.

2. Political participation and input sources of access political participation had a significant impact on sources of input access for farmers. Farmers who are participating in politics have better access to input sources from either formal or politicized channels, such as government initiatives, subsidized sourcing points, or party-based sources. The other group had access from informal channels, such as markets or from individual suppliers, which may also attract additional costs. This means that political participation enhances preferred access through subsidized input channels.

3. Effects of political participation on input expenditure

The Double Hurdle Model offered proof that political participation increases general spending on agricultural inputs. Farm participants were likely to spend on fertilizers, improved seeds, or other productivity-boosting inputs. Given that individuals spent, participants exceeded non-participants in allocated amounts, underlining the significance of political involvement in enhancing access to, as well as utilization of, essential agricultural resources

4. Effects of Political Participation on Agricultural Labour Productivity

Outcome equations from the ESR model showed that politically active farmers had higher labour productivity than non-participants. Education, farm size, and Input expenditure had a positive effect on the productivity of participants, but older age reduced efficiency. For non-participants, productivity was similarly influenced by the

same variables, albeit in relatively smaller magnitudes, suggesting that political participation improves efficiency

5. Average treatment effects (ATT, ATU, ATE) and their implications

This was further confirmed by the treatment effects analysis, which showed that political participation has a positive causal effect on agricultural productivity. While the ATT revealed that the treated-that is, the participants-had a higher labour productivity, the ATU indicated that, were it not for their decision to be politically engaged, this could have been achieved by the farmers who did not participate. The overall ATE therefore suggests that political engagement has economic benefits in terms of enhanced efficiency in the use of labour and other inputs.

5.2 Conclusions

This study investigated the impact of farmer political participation on input access, input expenditure, and agricultural labour productivity in Ghana. The results from the ESR, Double Hurdle, and MVP models allow for a clear synthesis relative to the research objectives.

The analysis indeed confirms political participation to be an important determinant of access to inputs, as well as farm-level productivity. Farmers who participated in political activities, either through rallies, campaigning, or by contributions, were more likely to obtain inputs from the government and subsidized channels, and they tended to spend more money on inputs and achieved higher labour productivity compared to non-participating farmers. Determinants of participation include some household characteristics such as gender, education, age, household size, and whether self-

employed, as well as regional effects. Average treatment effects further underscore that politically active farmers reap substantial benefits, and that it would be possible for non-participants to realize similar gains if they were politically active. The study contributes to the political economy of agricultural development by showing that farmer political participation acts as an institutional means of accessing resources and improving productivity. It thus confirms theories suggesting that political engagement can influence economic outcomes through changing the distribution of state-mediated agricultural inputs and facilitating technology adoption. The results support frameworks that place the role of institutions, governance, and political incentives at the center of farmer decision-making and productivity outcomes.

In policy terms, the results imply that the reduction of dependence on political connections is a prerequisite for achieving balanced distribution and advancement in labour productivity. It is obvious that politically active farmers benefit at the expense of the non-participants because the result implies that a balanced and meritorious way of allocating resources needs be designed. In this respect, institutional reforms should be contemplated by policymakers, in which input access and subsidies become delinked from political patronage, extension services function more efficiently, and where capacity building improves farmer awareness and participation. This would ensure that agricultural programs, including those on productivity enhancement, achieve full impact in the sector.

Contribution to Literature: This adds to the growing body of research regarding the relationship that exists between political participation and agricultural development within Ghana and Sub-Saharan Africa. It also provides empirical evidence on how

political engagement is related to access to inputs, expenditure, and labour productivity; it demonstrates direct and indirect pathways through which politics shapes farm-level outcomes. By integrating several econometric approaches-MVP, Double Hurdle, and ESR-the study also contributes to methodological robustness and rigor, hence constituting a valuable contribution to the research agenda related to the political economy of rural livelihoods.

In conclusion, Farmer political involvement in Ghana is thus neither solely a civic nor symbolic act but rather a political move that influences resource availability and agricultural productivity. Pursuing inclusive and transparent methods to deliver resources can capitalize on this political reality to improve agricultural productivity while, at the same time, addressing issues related to inequality to facilitate a more balanced development among the farming community.

5.3 Policy Recommendations

Following the findings of the study on the effects of farmer political participation on access to inputs, expenditure, and agricultural labour productivity in Ghana, several recommendations have been generated for use by policymakers, agricultural agencies, and farmer organizations:

1. Improving Equitable Access to Inputs:

it should be made transparent through the development of mechanisms in the government and the agricultural sector for the distribution of subsidized resources to the farmers without conferring any political advantage or political persuasions/orientations.

The tracking of input allocations can be implemented through the introduction of digital platforms, which have been implemented to curb elite capture or favoritism by the Government.

Farmer associations at the local level need to be strengthened to enable them to be part of the oversight of input distribution.

2. Encouraging Inclusive Political Participation

The government should lunche training programs and awareness-raising programs to motivate all farmers, including the marginalized ones, to participate effectively in all civic and agricultural policy processes.

Extension officers and agricultural development agents should ensure there are inclusive dialogues between local governments and farmers to improve access to resources by those not aligned politically.

Also, the government should promote the development of platforms such as community-based farming committees, in which productivity, not loyalty, is rewarded.

4. Institutional and Governance Reforms:

Decentralizing the distribution of input support services as well as the distribution of support to farmers by ensuring that an element of accountability exists that avoids any political manipulation. Farmers' support services must be constantly monitored and assessed to ensure the achievement of goals with respect to fairness, efficiency, and productivity. Encourage the coordination of all relevant bodies with the government and business organizations as well as those providing support, but not associated with political groups or political parties.

Overall Recommendation: There is a need to remove political power from resource allocation in the agricultural sector, meaning that all farmers should have an equal opportunity to access resources in the country. Inclusive political systems can contribute towards the increase of labour productivity in Ghana.

REFERENCES

Abdisa, T., Mehare, A., & Wakeyo, M. B. (2024). Analyzing gender gap in agricultural productivity: Evidence from Ethiopia. *Journal of Agriculture and Food Research*, *15*, 100960.

Abdul-Rahaman, A. (2023). Can improved sorghum varieties enhance farm performance and household welfare? Evidence from Upper East Region of Ghana. *Journal of Agriculture and Food Research*, *13*, 100664.

Abdul-Rahaman, A., & Abdulai, A. (2020). Farmer groups, collective marketing and smallholder farm performance in rural Ghana. *Journal of Agribusiness in Developing and Emerging Economies*, *10*(5), 511–527.

Abdulai, A.-G. (2021). Competitive clientelism, donors and the politics of social protection uptake in Ghana. *Critical Social Policy*, *41*(2), 270–293.

Abdulai, A.-R., Oklikah, D. O., Abdulai, A.-S. J., Mohammed, K., & Alhassan, A. Y. (2024). State policies and smallholders politics in Ghana's agriculture 'modernization'paradigm: a policy review. *SN Social Sciences*, *4*(11), 202.

Abman, R., & Carney, C. (2020). Agricultural productivity and deforestation: Evidence from input subsidies and ethnic favoritism in Malawi. *Journal of Environmental Economics and Management*, *103*, 102342.

Acemoglu, D., & Robinson, J. A. (2013). *Why nations fail: The origins of power, prosperity, and poverty*. Crown Currency.

Acheampong, E. O., Sayer, J., Macgregor, C. J., & Sloan, S. (2021). Factors influencing the adoption of agricultural practices in Ghana's forest-fringe communities. *Land*, *10*(3), 266.

Adams, A., Caesar, L. D., & Asafu-Adjaye, N. Y. (2022). What informs farmers' choice of output markets? The case of maize, cowpea and livestock production in Northern Ghana. *International Journal of Rural Management*, *18*(1), 56–77.

Adams, A., Osei-Amponsah, C., & Tetteh Jumpah, E. (2020). Analysing the determinants, constraints and opportunities of smallholder farmers access to input markets: Evidence from northern Ghana. *Journal of Agribusiness and Rural Development*, *56*(2), 133–143.

Addai, K. N., Temoso, O., & Ng'ombe, J. N. (2023). Heterogeneous effects of agricultural technology adoption on smallholder household welfare in Ghana. *Journal of Agricultural and Applied Economics*, *55*(2), 283–303.

Adjognon, G. S., Liverpool-Tasie, S., Dillon, A., & Bloem, J. (2021). *Transaction Costs, Input Subsidies, and Climate-Smart Agricultural Technology Adoption: Experimental Evidence from Rice Farmers in Nigeria*.

Adzawla, W., Setsoafia, E. D., Setsoafia, E. D., Amoabeng-Nimako, S., Atakora, W. K., Camara, O., Jemo, M., & Bindraban, P. S. (2024). Fertilizer use efficiency and economic viability in maize production in the Savannah and transitional zones of Ghana. *Frontiers in Sustainable Food Systems*, *8*, 1340927.

African Development Bank. (2021). *African Economic Outlook African Economic Outlook*.

Agbolosoo, J. A., & Hutagaol, M. P. (2024). A Review of the Government Food Policy on Agricultural Productivity in Ghana. *Journal of Public Policy*, *8*(4), 169–176.

Aguilar, A., Carranza, E., Goldstein, M., Kilic, T., & Oseni, G. (2015). Decomposition of gender differentials in agricultural productivity in Ethiopia. *Agricultural Economics*, *46*(3), 311–334.

Agyemang, S. A., Bavorová, M., & Ratinger, T. (2025). Do Perceptions of Rent-seeking Affect Farmers' Attitude to Participating in Agricultural Input Support Programmes? *The European Journal of Development Research*, 1–22.

Aidoo, M., Prah, S., Asante, I. S., Sackey, C. K., & Asante, B. O. (2025). Cultivating a thriving agricultural sector: Unveiling the drivers of farmer participation in agricultural development interventions in Ghana. *Social Sciences & Humanities Open*, *11*, 101297.

Akpan, S. B., & Udoh, E. J. (2016). Farmers' decision to participate in government agricultural programmes in a volatile political environment: a case study of farmers in the South-South region of Nigeria. *Russian Journal of Agricultural and Socio-Economic Sciences*, *53*(5), 135–148.

Akyeampong, B. (2024). The politics of beneficiary selection: A case study of Ghana's Livelihood Empowerment Against Poverty (LEAP) cash transfer programme.

Global Social Policy, *24*(3), 390–411.

Alawode, A. (2025). Evaluating agricultural subsidy reforms and their effects on smallholder farmer income and efficiency. *International Journal of Advance Research Publication and Reviews*, *2*(5), 180–201.

Ameye, H., Bachewe, F. N., Minten, B., & Tamru, S. (2025). Farm size and agricultural productivity of nutritious foods: Evidence from Ethiopia. *Journal of Agricultural Economics*.

Amoako, S., Miroslava, A., & Tomáš, B. (2025). Do Perceptions of Rent - seeking Affect Farmers ' Attitude to Participating in Agricultural Input Support Programmes ? *The European Journal of Development Research*, *0123456789*. https://doi.org/10.1057/s41287-025-00697-6

Amoakoh-Coleman, M., Kayode, G. A., Brown-Davies, C., Agyepong, I. A., Grobbee, D. E., Klipstein-Grobusch, K., & Ansah, E. K. (2015). Completeness and accuracy of data transfer of routine maternal health services data in the greater Accra region. *BMC Research Notes*, *8*(1), 114.

Anang, B. T., Amesimeku, J., & Fearon, J. (2021). Drivers of adoption of crop protection and soil fertility management practices among smallholder soybean farmers in Tolon district of Ghana. *Heliyon*, *7*(5).

Anang, B. T., & Asante, B. O. (2020). *Farm household access to agricultural services in northern Ghana. Heliyon, 6 (11), e05517*.

Anderson, K., & Ponnusamy, S. (2023). Structural transformation away from agriculture in growing open economies. *Agricultural Economics*, *54*(1), 62–76.

Anzia, S. F., Jares, J. A., & Malhotra, N. (2022). Does receiving government assistance shape political attitudes? Evidence from agricultural producers. *American Political Science Review*, *116*(4), 1389–1406.

Appiah-Twumasi, M., Donkoh, S. A., & Ansah, I. G. K. (2022). Innovations in smallholder agricultural financing and economic efficiency of maize production in Ghana's northern region. *Heliyon*, *8*(12).

Aremu, T., Baye, R. S., Onyina, K., & Abijah, P. (2025). Agricultural extension services and household welfare: evidence from Ghana socioeconomic panel survey. *Agricultural and Food Economics*, *13*(1), 58.

Arndt, C., McKay, A., & Tarp, F. (2016). *Growth and poverty in sub-Saharan Africa*. Oxford University Press.

Asante, B. O., Ma, W., Prah, S., & Temoso, O. (2024). Farmers' adoption of multiple climate-smart agricultural technologies in Ghana: determinants and impacts on maize yields and net farm income. *Mitigation and Adaptation Strategies for Global Change*, *29*(2), 16.

Asante, F. A., & Bawakyillenuo, S. (2021). *Farm-level effects of the 2019 Ghana planting for food and jobs program: An analysis of household survey data* (Vol. 57). Intl Food Policy Res Inst.

Asante, K. T. (2023). The politics of policy failure in Ghana: The case of oil palm. *World Development Perspectives*, *31*, 100509.

Asante, K. T., & Mullard, S. (2021). Social accountability and anti-corruption in Ghana's Fertiliser Subsidy Programme. *U4 Issue 2021*, *6*.

Asfaw, S., Shiferaw, B., Simtowe, F., & Lipper, L. (2012). Impact of modern agricultural technologies on smallholder welfare: Evidence from Tanzania and Ethiopia. *Food Policy*, *37*(3), 283–295.

Assouto, A. B., & Houngbeme, D. J.-L. (2023). Access to credit and agricultural productivity: Evidence from maize producers in Benin. *Cogent Economics & Finance*, *11*(1), 2196856.

Atta-Aidoo, J., Antwi-Agyei, P., Dougill, A. J., Ogbanje, C. E., Akoto-Danso, E. K., & Eze, S. (2022). Adoption of climate-smart agricultural practices by smallholder farmers in rural Ghana: An application of the theory of planned behavior. *PLoS Climate*, *1*(10), e0000082.

Awafo, E. A., Amrago, E. C., Amankwah, E., & Akolgo, G. A. (2024). Planting for food and jobs participation and its impact on maize productivity in Ghana: implications for research and policy. *Cogent Social Sciences*, *10*(1), 2328883.

Ayamga, M. (2023). Contract Farming and Smallholder Farmer Productivity in Northern Ghana: Does Farm Size Matter? *Ghana Journal of Science, Technology and Development*, *9*(1), 89–104.

Ayee, J. R. A., Amoah, L. G. A., & Alidu, S. M. (2024). *Political Institutions, Party Politics and Communication in Ghana: Three Decades of the Fourth Republic*. Springer Nature.

Baldwin, K. (2016). *The paradox of traditional chiefs in democratic Africa*. Cambridge University Press.

Banful, A. B. (2011). Old problems in the new solutions? Politically motivated allocation of program benefits and the "new" fertilizer subsidies. *World Development*, *39*(7), 1166–1176.

Bank, W. (2022). *The World Bank Annual Report 2022: Helping Countries Adapt to a Changing World*. http://hdl.handle.net/10986/37972

Bardhan, P., & Mookherjee, D. (2012). Political clientelism and capture: Theory and evidence from West Bengal. *Work. Pap., Inst. Econ. Dev., Boston Univ*.

Bates, R. H., & Block, S. A. (2013). Revisiting African agriculture: Institutional change and productivity growth. *The Journal of Politics*, *75*(2), 372–384.

Baylie, M. M., & Pércsi, K. N. (2025). Examining access and impact of agricultural extension services on crop yield in Farta Woreda, Ethiopia, using endogenous switching regression model. *Agriculture & Food Security*, *14*(1), 32.

Bazzi, S., & Gudgeon, M. (2021). The political boundaries of ethnic divisions. *American Economic Journal: Applied Economics*, *13*(1), 235–266.

Beaman, L., BenYishay, A., Magruder, J., & Mobarak, A. M. (2021). Can network theory-based targeting increase technology adoption? *American Economic Review*, *111*(6), 1918–1943.

Bénichou, W. (2023). Sustainable development of transport infrastructure in the system of national economy. *Journal of Economics, Innovative Management and Entrepreneurship*, *1*(1).

Benin, S., Kennedy, A., Lambert, M., & McBride, L. (2010). *Monitoring African agriculture development processes and performance: A comparative analysis*.

Berhane, G., Ragasa, C., Abate, G. T., & Assefa, T. (2020). *Ethiopia [In Agricultural Extension]*.

Boda, C. S., Ekumah, B., Isgren, E., Akorsu, A. D., Armah, F. A., & Hombey, C. T. (2024). Every farmer is a farmer? A critical analysis of the emergence and development of Peasant Farmers Association of Ghana. *Geoforum*, *150*, 103995.

Bode, L. (2017). Gateway political behaviors: The frequency and consequences of low-cost political engagement on social media. *Social Media+ Society*, *3*(4), 2056305117743349.

Boillat, S., & Bottazzi, P. (2020). Agroecology as a pathway to resilience justice: peasant movements and collective action in the Niayes coastal region of Senegal. *International Journal of Sustainable Development & World Ecology*, *27*(7), 662–677.

Boone, C., Crespin-Boucaud, J., & Kim, E. K. (2025). Sectoral Interests and Regional Bloc Voting in African Countries. *Studies in Comparative International Development*, 1–39.

Bottazzi, P., & Boillat, S. (2021). Political agroecology in Senegal: Historicity and repertoires of collective actions of an emerging social movement. *Sustainability*, *13*(11), 6352.

Brady, H. E., Verba, S., Lehman, K. A. Y., & Boston, S. (1995). *Beyond Ses : A Resource Model of Political Participation Author (s): Henry E . Brady , Sidney Verba and Kay Lehman Schlozman Published by : American Political Science Association Stable URL : https://www.jstor.org/stable/2082425 BEYOND SES : A RESOURCE* . *89*(2), 271–294.

Byaruhanga, R., Isgren, E., & Kavak, S. (2025). Politicising agricultural transformation through farmer groups' everyday collective practices. *Journal of Rural Studies*, *120*, 103859.

Callahan, S. (2019). Do campaign contributions from farmers influence agricultural policy? evidence from a 2008 farm bill amendment vote to curtail cotton subsidies. *Journal of Agricultural and Applied Economics*, *51*(3), 417–433.

Cappellari, L., & Jenkins, S. P. (2003). Multivariate probit regression using simulated maximum likelihood. *The STATA Journal*, *3*(3), 278–294.

Carter, M., de Janvry, A., Sadoulet, E., & Sarris, A. (2017). Index insurance for

developing country agriculture: a reassessment. *Annual Review of Resource Economics*, *9*(1), 421–438.

Cavicchioli, D., Bertoni, D., Frisio, D. G., & Pretolani, R. (2019). Does the future of a farm depend on its neighbourhood? Evidence on intra-family succession among fruit and vegetable farms in Italy. *Agricultural and Food Economics*, *7*(1), 10.

Chinsinga, B. (2011). *Agro-dealers, subsidies and rural market development in Malawi: A political economy enquiry*.

Chirwa, E., & Dorward, A. (2013). *Agricultural input subsidies: The recent Malawi experience*. Oxford university press.

Coordination, T. I. (2018). *IMPROVING PUBLIC SECTOR*. *October*.

Creswell, J. W. (2014). *Investigação Qualitativa e Projeto de Pesquisa-: Escolhendo entre Cinco Abordagens*. Penso Editora.

Dachito, A., & Angelo, A. (2021). Farmersâ€™ technology adoption decision and use intensity in the agricultural sector: Case of Masha Woreda (Double Hurdle Model). *Jurnal Perspektif Pembiayaan Dan Pembangunan Daerah*, *9*(1), 51–60.

Dalton, R. J. (2017). *The participation gap: Social status and political inequality*. Oxford University Press.

Darko, F. A., Palacios-Lopez, A., Kilic, T., & Ricker-Gilbert, J. (2020). Micro-level

welfare impacts of agricultural productivity: Evidence from rural Malawi. In *The Transformation of Rural Africa* (pp. 149–174). Routledge.

Davis, K. E., Babu, S. C., & Ragasa, C. (2020). *Agricultural extension: Global status and performance in selected countries*. Intl Food Policy Res Inst.

Davis, K. E., Makhija, S., & Spielman, D. J. (2021). *Agricultural extension and rural advisory services: What have we learned? What's next?* Intl Food Policy Res Inst.

De la O Campos, A. P., Admasu, Y., Covarrubias, K. A., Davis, B., & Diaz, A. M. (2023). *Economic transformation and diversification towards off-farm income in rural and urban areas–A global update with a focus on sub-Saharan Africa*.

De Sousa, R. R. P., & Cuadrado, J. (2023). Neopatrimonialism in Africa: A review of concepts, practices and implications. *Africa Review*, *15*(3), 316–337.

Demsa, S., Agustina, S., Anita, S. christina, & Anang, W. (2021). *MoFA Urges a Nationwide Farmer Cooperative Initiative to Boost Food Security and Agribusiness*. Continum of Care Pada Ibu Dengan Anak Stunting Dan Perilaku Kunjungan Posyandu Balita Pada Masa Pandemi Covid-19. https://www.mofa.gov.gh/site/index.php/media-centre/latest-news/item/672-mofa-urges-a-nationwide-farmer-cooperative-initiative-to-boost-food-security-and-agribusiness

Diao, X., & Sarpong, D. B. (2011). Poverty implications of agricultural land degradation in Ghana: an economy-wide, multimarket model assessment. *African Development*

Review, *23*(3), 263–275.

Dionne, K. Y., & Horowitz, J. (2016). The political effects of agricultural subsidies in Africa: Evidence from Malawi. *World Development*, *87*, 215–226.

Donkor, E., Amegbe, E. Dela, Ratinger, T., & Hejkrlik, J. (2023). The effect of producer groups on the productivity and technical efficiency of smallholder cocoa farmers in Ghana. *PLoS ONE*, *18*(12 December), 1–20. https://doi.org/10.1371/journal.pone.0294716

Doss, C. R. (2025). *Gender and Agricultural Productivity*. 21–39.

Druilhe, Z., & Barreiro-Hurlé, J. (2012). *Fertilizer subsidies in sub-Saharan Africa*.

Dubbert, C. (2019). Participation in contract farming and farm performance: Insights from cashew farmers in Ghana. *Agricultural Economics*, *50*(6), 749–763.

Duguma, A. (2016). The role of agricultural cooperatives in risk management and impact on farm income: Evidence from Southern Ethiopia. *Journal of Economics and Sustainable Development*, *7*(21), 89–99.

Dwomoh, D., Agyabeng, K., Tuffour, H. O., Tetteh, A., Godi, A., & Aryeetey, R. (2023). Modeling inequality in access to agricultural productive resources and socioeconomic determinants of household food security in Ghana: a cross-sectional study. *Agricultural and Food Economics*, *11*(1), 24.

Dzanku, F. M. (2015). Transient rural livelihoods and poverty in Ghana. *Journal of Rural Studies*, *40*, 102–110.

Ekman, J., & Amnå, E. (2022). Civic engagement. *The Oxford Handbook of Political Participation*, 381–395.

Ellis, F. (1993). *Peasant economics: Farm households in agrarian development* (Vol. 23). Cambridge University Press.

Faguet, J.-P. (2014). Decentralization and governance. *World Development*, *53*, 2–13.

FAO. (2021). The state of food and agriculture 2021. Making agrifood systems more resilient to shocks and stresses. *Rome, FAO*.

Fasakin, I. J., Ogunniyi, A. I., Bello, L. O., Mignouna, D., Adeoti, R., Bamba, Z., Abdoulaye, T., & Awotide, B. A. (2022). Impact of intensive youth participation in agriculture on rural households' revenue: Evidence from rice farming households in Nigeria. *Agriculture*, *12*(5), 584.

Fischer, E., & Qaim, M. (2012). Linking smallholders to markets: determinants and impacts of farmer collective action in Kenya. *World Development*, *40*(6), 1255–1268.

Food, M. O. F. F. A. A. (2019). *Agriculture In Ghana Facts And Figures*. *2018*.

Foster, A. (2011). Are Indian Farms Too Small? *Mechanization, Agency Costs, and*

Farm Efficiency. Brown University, Providence, RI US.

Fransman, T., & von Fintel, M. (2024). Relative standing and political participation. *Social Indicators Research*, *174*(1), 281–311.

Ghana Incentive-Based Risk-Sharing System for Agricultural Lending (GIRSAL). (2023). *Assessment of the Fertilizer Subsidy Program Under PFJ Report on Study Findings and*. *June*.

GLSS7. (2019). *Ghana Living Standards Survey*.

Goldstein, M., & Udry, C. (2008). The profits of power: Land rights and agricultural investment in Ghana. *Journal of Political Economy*, *116*(6), 981–1022.

Gollin, D., & Udry, C. (2021). Heterogeneity, measurement error, and misallocation: Evidence from African agriculture. *Journal of Political Economy*, *129*(1), 1–80.

Gouët, C., & Van Paassen, A. (2012). Smallholder marketing cooperatives and smallholders' market access: lessons learned from the actors involved. *The Journal of Agricultural Education and Extension*, *18*(4), 369–385.

Greene, W. H. (2018). Econometric analysis/Limdep users manual. *Retrieved on July*, *15*, 2022.

Hastings, J., & Ubilava, D. (2024). *Agricultural Roots of Social Conflict in Southeast Asia*.

Herrendorf, B., & Schoellman, T. (2015). Why is measured productivity so low in agriculture? *Review of Economic Dynamics*, *18*(4), 1003–1022.

Hillebrecht, M., Klonner, S., & Pacere, N. A. (2023). The dynamics of poverty targeting. *Journal of Development Economics*, *161*, 103033.

Hlatshwayo, S. I., Ngidi, M. S. C., Ojo, T. O., Modi, A. T., Mabhaudhi, T., & Slotow, R. (2023). The determinants of crop productivity and its effect on food and nutrition security in rural communities of South Africa. *Frontiers in Sustainable Food Systems*, *7*, 1091333.

Hoffmann, C. P., & Lutz, C. (2021). Digital divides in political participation: The mediating role of social media self-efficacy and privacy concerns. *Policy & Internet*, *13*(1), 6–29.

Houssou, N., Andam, K. S., & Asante-Addo, C. (2017). Lessons from Ghana and other countries in Africa south of the Sahara: Can better targeting improve the effectiveness of Ghana's Fertilizer Subsidy Program? *IFPRI*.

Iddrisu, A., Nkegbe, P. K., & Mabe, F. N. (2025). Market participation intensity of smallholder farmers in the Northern Region of Ghana. *Discover Agriculture*, *3*(1), 236.

Iddrisu, A. Y., Ouma, S., & Yaro, J. A. (2022). When agricultural commercialization fails:'Re-visiting'value-chain agriculture and its ruins in northern Ghana. *Globalizations*, 1–21.

Ievsieieva, O., Kolisnyk, M., Yatsenko, O., Chornovol, A., & Bocharova, N. (2024). Financial modeling and forecasting in corporate finance management. *Economic Affairs*, *69*(1), 629–646.

International Budget Partnership (IBP). (2021). *25 Years of Making Budgets Work for People*. https://internationalbudget.org/wp-content/uploads/IBP-annual-report-2021.pdf

International Monetary Fund (IMF). (2024). Agricultural producer subsidies. In *Producer subsidies*. https://doi.org/10.5089/9798400285950.068

International Fund for Agricultural Development IFAD). (2021). . *(2021). Transforming food systemTransforming food systems for rIFADs for rural prosperity.ural prosperity*.

Jacob Ricker-Gilbert, Mindy Mallory, Iredele Ogunbayo, & Innocent Pangapanga-Phir. (2024). *Causes and Consequences of the 2021/22 Fertilizer Price Spike on sub-Saharan Africa. Lessons Learned and Implications for Future Actions*. *September*, 216. https://www.coebs.sua.ac.tz/news/report-causes-and-consequences-of-the-2021-22-fertilizer-price-spike-on-sub-saharan-africa

Jafari, Y., Engemann, H., & Zimmermann, A. (2023). Food trade and regional trade agreements–A network perspective. *Food Policy*, *119*, 102516.

Jayne, T. S., Mason, N. M., Burke, W. J., & Ariga, J. (2016). *Agricultural input subsidy programs in Africa: An assessment of recent evidence*.

Jayne, T. S., Mason, N. M., Burke, W. J., & Ariga, J. (2017). *Taking Stock of Africa's Second-Generation Agricultural Input Subsidy Programs, 2000-2015*.

Jayne, T. S., Mason, N. M., Burke, W. J., & Ariga, J. (2018). Taking stock of Africa's second-generation agricultural input subsidy programs. *Food Policy*, *75*, 1–14.

Jayne, T. S., & Rashid, S. (2013). Input subsidy programs in sub-Saharan Africa: a synthesis of recent evidence. *Agricultural Economics*, *44*(6), 547–562.

Jayne, T. S., Wineman, A., Chamberlin, J., Muyanga, M., & Yeboah, F. K. (2022). Changing farm size distributions and agricultural transformation in sub-Saharan Africa. *Annual Review of Resource Economics*, *14*(1), 109–130.

Jenzen, O., Erhart, I., Eslen-Ziya, H., Korkut, U., & McGarry, A. (2021). The symbol of social media in contemporary protest: Twitter and the Gezi Park movement. *Convergence*, *27*(2), 414–437.

Johnston, M. P. (2014). Secondary data analysis: A method of which the time has come. *Qualitative and Quantitative Methods in Libraries*, *3*(3), 619–626.

Kamara, A., Conteh, A., Rhodes, E. R., & Cooke, R. A. (2019). The relevance of smallholder farming to African agricultural growth and development. *African Journal of Food, Agriculture, Nutrition and Development*, *19*(1), 14043–14065.

Kapoor, R., Das, M., & Sanyal, A. (2025). The Girl on the Train: Effect of Delhi Metro Transit System on Women's Employment_. *Available at SSRN 5247336*.

Kassa, Y., Giziew, A., & Ayalew, D. (2021). Determinants of adoption and intensity of improved faba bean cultivars in the central highlands of Ethiopia: a double-hurdle approach. *CABI Agriculture and Bioscience*, *2*(1), 24.

Kassie, M., Wossen, T., De Groote, H., Tefera, T., Sevgan, S., & Balew, S. (2020). Economic impacts of fall armyworm and its management strategies: evidence from southern Ethiopia. *European Review of Agricultural Economics*, *47*(4), 1473–1501.

Keefer, P., & Khemani, S. (2024). Media's Influence on Citizen Demand for Public Goods. *Economic Development and Cultural Change*, *72*(4), 1615–1651.

Kehinde, A. D., Adeyemo, R., & Ogundeji, A. A. (2021). Does social capital improve farm productivity and food security? Evidence from cocoa-based farming households in Southwestern Nigeria. *Heliyon*, *7*(3).

Kehinde, A. D., Ojo, T. O., & Ogundeji, A. A. (2024). Impact of participation in social capital networks on the technical efficiency of maize producers in Southwest Nigeria. *Agriculture & Food Security*, *13*(1), 12.

Kerorsa, G. M. (2025). Determinants of technical efficiency among smallholder maize producing farmers in Guto Gidda district, Oromia, Ethiopia. *Discover Global Society*, *3*(1), 1–24.

Kos, D., Lensink, R., & Meuwissen, M. (2023). The role of social capital in adoption of risky versus less risky subsidized input supplies: An empirical study of cocoa

farmers in Ghana. *Journal of Rural Studies*, *97*, 140–152.

Kramon, E. (2016). Electoral handouts as information: Explaining unmonitored vote buying. *World Politics*, *68*(3), 454–498.

Kramon, E. (2019). Ethnic group institutions and electoral clientelism. *Party Politics*, *25*(3), 435–447.

Kuntashula, E., & Mwelwa-Zgambo, L. (2022). Impact of the farmer input support policy on agricultural production diversity and dietary diversity in Zambia. *Food Policy*, *113*, 102329.

Kwaku, C. (2025). Political Economy of Food Security: Interrogating the Planting for Food and Jobs Policy Intervention in Ghana. *African Food Systems: Rethinking Prospects for Continental Sustainable Transformation*, 121.

Kwapong, N. A., Ankrah, D. A., Anaglo, J. N., & Vukey, E. Y. (2021). Determinants of scale of farm operation in the eastern region of Ghana. *Agriculture & Food Security*, *10*(1), 31.

Kwon, D., Myers, R. J., & Mason, N. M. (2022). *How do input subsidy programs affect smallholder households' dietary diversity? Evidence from Zambia*.

Laing, T., & Weschler, S. (2024). Rural radicalism and the tactic of third-party leverage: How Acholi peasants drew a UN agency into their struggle against land-grabbing by the Ugandan state. *African Studies Review*, *67*(1), 38–66.

Lin, T., Ko, A. P., Than, M. M., Catacutan, D. C., Finlayson, R. F., & Isaac, M. E. (2021). Farmer social networks: The role of advice ties and organizational leadership in agroforestry adoption. *Plos One*, *16*(8), e0255987.

Liverpool-Tasie, L. S., Dillon, A., Bloem, J. R., & Adjognon, G. S. (2023). *Private sector promotion of climate-smart technologies: Experimental evidence from Nigeria* (Vol. 2155). Intl Food Policy Res Inst.

Liverpool-Tasie, L. S. O., Gurmu, M. Y., Mason, N. M., & Tambo, J. A. (2025). The Changing Landscape of Africa's Fertilizer Market: Implications for Research and Policy. *Annual Review of Resource Economics*, *17*.

Lokshin, M., & Sajaia, Z. (2004). Maximum likelihood estimation of endogenous switching regression models. *The Stata Journal*, *4*(3), 282–289.

Ma, W., Marini, M. A., & Rahut, D. B. (2023). Farmers' organizations and sustainable development: An introduction. *Annals of Public and Cooperative Economics*, *94*(3), 683–700. https://doi.org/10.1111/apce.12449

Malabayabas, M. L., & Mishra, A. K. (2022). Assessing inverse relationship in joint farm decision-making households: An empirical evidence from Eastern India. *Frontiers in Sustainable Food Systems*, *6*, 1000156.

Malimi, K. (2023). Agricultural input subsidies, extension services, and farm labour productivity nexus: Evidence from maize farmers in Tanzania. *Journal of Agricultural Economics*, *74*(3), 874–898.

Marie, O., Ye, Z., Post, T., & Zou, X. (2025). From Two Heads to One: Electoral and Governance Consequences of Political Recentralization. *Available at SSRN 5263636*.

Marson, M. (2025). Effects of public expenditure for agriculture on food security in Africa. *Empirical Economics*, *68*(6), 2673–2704.

Martey, E., Etwire, P. M., Asante-Addo, C., & Suraj, M. M. (2025). Conflict Exposure and Agricultural Diversification in Ghana. *The Journal of Development Studies*, 1–24.

Martinez-Gil, J., Pichler, M., Lechat, N., Lentini, G., Cvar, N., Trilar, J., Bucchiarone, A., & Marconi, A. (2025). An overview of civic engagement tools for rural communities. *Open Research Europe*, *4*, 195.

McFarland, A., Workneh, Z. G., & Carlson, A. (2022). Examining sanitation services for human excreta in Addis Ababa, Ethiopia. *World Development Perspectives*, *26*, 100416.

Mensah, E., Osei, C. K., Asantewaa, J. K., & Aboagye, R. (2023). Access to and use of agricultural information among maize farmers in Ejura Sekyedumase Municipality. *International Journal of Agricultural Studies 2 (1)*, 1–20.

Mercoiret, M.-R., Pesche, D., & Bosc, P.-M. (2007). *Rural producers organizations for pro-poor sustainable agricultural development: workshop proceedings Paris, France, 30-31 October 2006*.

Midamba, D. C., Jjengo, A., & Ouko, K. O. (2025). Understanding gender differences in maize productivity among smallholders in central Uganda: a total factor productivity approach. *Discover Agriculture*, *3*(1), 1–17.

Miine, L. K., Akorsu, A. D., Boampong, O., & Bukari, S. (2024). Effects of digital agriculture solutions on smallscale wage workers and employment. *Cogent Social Sciences*, *10*(1), 2329782.

Minah, M. (2021). *What is the influence of government programs on farmer organizations and their impacts ? Evidence from Zambia*. *December 2020*, 29–53. https://doi.org/10.1111/apce.12316

Minah, M. (2022). What is the influence of government programs on farmer organizations and their impacts? Evidence from Zambia. *Annals of Public and Cooperative Economics*, *93*(1), 29–53.

Ministry of Food and Agriculture (MoFA). (2022). *AGRICULTURE IN* (Issue September).

Ministry of Food and Agriculture Bank (MoFA). (2025). *Ministry of food and agriculture*.

Mogues, T., & Do Rosario, D. (2016). The political economy of public expenditures in agriculture: Applications of concepts to Mozambique. *South African Journal of Economics*, *84*(1), 20–39.

Nathan, N. L. (2019). Does participation reinforce patronage? Policy preferences, turnout and class in urban Ghana. *British Journal of Political Science*, *49*(1), 229–255.

Nchanji, E. B., & Lutomia, C. K. (2021). Regional impact of COVID-19 on the production and food security of common bean smallholder farmers in Sub-Saharan Africa: Implication for SDG's. *Global Food Security*, *29*, 100524.

Nie, N. H., Verba, S., Kim, J., Nie, N. H., Verba, S., & Kim, J. (1974). *Political Participation and the Life Cycle of New York Stable URL : https://www.jstor.org/stable/421518 Political Participation and The Life Cycle*. *6*(3), 319–340.

Nkegbe, P. K., Araar, A., Abu, B. M., Alhassan, H., Ustarz, Y., Setsoafia, E. D., & Abdul-Wahab, S. (2022). Nonfarm activity and market participation by farmers in Ghana. *Agricultural and Food Economics*, *10*(1), 4.

Nourani, V., Maertens, A., & Michelson, H. (2021). Public good provision and democracy: Evidence from an experiment with farmer groups in Malawi. *World Development*, *145*, 105507.

Nuhu Jinbaani, A., & Wale, E. (2023). How does participation in Ghana's fertilizer subsidy program (GFSP) affect the adoption of sustainable intensification practices (SIPs) and gross farm inputs? *Development Studies Research*, *10*(1), 2180047.

Nyirongo, B. B., & Khataza, R. (2025). The impact of farm input subsidies on

improving fertilizer use and enhancing maize productivity in Malawi. *Discover Agriculture*, *3*(1), 1–11.

Ojo, M. A., Diye, M., Coker, A. A. A., & Ojo, A. O. (2021). *The impact of market access on input use and agricultural productivity among cereal crop farmers in Niger State, Nigeria*.

Okumu, J. J., Sibiko, K. W., Mose, P. B., & Ouko, K. O. (2023). Determinants of smallholder farmers' extent of participation in climate-smart agricultural projects in Kakamega County, Kenya. *Cogent Social Sciences*, *9*(1), 2220236.

Olawuyi, S. O. (2020). *Eco-Friendly Agricultural Practices : Evidence From Smallholder Farmers In Seyi Olalekan Olawuyi , University of Fort Hare*. *23*(5), 590–611.

Osabohien, R., Jaaffar, A. H., Matthew, O., Osabuohien, E., Adeleke, O. K., Olonade, O. Y., Okoh, G. O., & Khalid, A. A. (2024). Soil management practice and smallholder agricultural productivity in Nigeria. *Discover Sustainability*, *5*(1), 283.

Ouerghemmi, H., Frija, A., Souissi, A., Carpentier, I., Shiri, Z., Dhehibi, B., & Rejeb, H. (2024). Are farmer organizations effective intermediaries and facilitators of agricultural innovations processes? Evidence from Tunisia. *Frontiers in Sustainable Food Systems*, *8*, 1440086.

Paller, J. W. (2021). Everyday politics and sustainable urban development in the Global South. *Area Development and Policy*, *6*(3), 319–336.

Pauw, K. (2022). A review of Ghana's planting for food and jobs program: implementation, impacts, benefits, and costs. *Food Security*, *14*(5), 1321–1335.

Pechlaner, G. (2010). The sociology of agriculture in transition: The political economy of agriculture after biotechnology. *Canadian Journal of Sociology*, *35*(2). https://doi.org/10.29173/cjs5114

Petrov, D. (2025). Agro-Governance And Agricultural Productivity: An Empirical Analysis Of Governance Indicators And Farm Performance. *E-Journal VFU*, *23*, 647–656.

Prah, S., Asante, B. O., Aidoo, R., Mensah, J. O., & Nimoh, F. (2023). Impact of agricultural policy intervention on yield and profitability of maize farmers: The case of Planting for Food and Jobs (PFJ) programme in Ghana. *Cogent Food & Agriculture*, *9*(1), 2249928.

Quisumbing, A. R., & Malapit, H. J. (2023). Women's Empowerment and Gender Equality in Philippine Agriculture: The Role of Education and Public Policy. *DLSU Business & Economics Review*, *33*(1).

Ragasa, C., Dankyi, A., Acheampong, P., Wiredu, A. N., Chapoto, A., Asamoah, M., & Tripp, R. (2013). *Patterns of adoption of improved maize technologies in Ghana. Ghana strategy support program International food policy research institute*. Working paper 36.

Resnick, D. (2024). Political economy of agriculture and food policy in Africa. *Annual*

Review of Resource Economics, *16*.

Ricciardi, V., Ramankutty, N., Mehrabi, Z., Jarvis, L., & Chookolingo, B. (2018). How much of the world's food do smallholders produce? *Global Food Security*, *17*, 64–72.

Saha, D., Nanduri, K., & Das, R. (2021). Agrarian reforms and farmers' protests in India: a policy perspective. *New Agenda: South African Journal of Social and Economic Policy*, *2021*(80), 37–41.

Salifu, G. A.-N., & Salifu, Z. (2024). The political economy of income diversification and food security in Northern Ghana. *Cogent Food & Agriculture*, *10*(1), 2325205.

Sheahan, M., & Barrett, C. B. (2017). Ten striking facts about agricultural input use in Sub-Saharan Africa. *Food Policy*, *67*, 12–25.

Sibanda, M. (2025). Feminist Agroecology: Towards Gender-Equal and Sustainable Food Systems in Sub-Saharan Africa. *Agricultural & Rural Studies*, *3*(1), 1.

Silva, B. (2018). *Understanding the financial vulnerability and the financial decisions of non-governmental organisations: an empirical study of Ugandan NGOs*. Stellenbosch University.

Šlapeta, J., Vande Velde, F., Martínez-Valladares, M., Canton, C., Claerebout, E., & Gilleard, J. S. (2024). Towards precision parasite management for livestock gastrointestinal nematodes in 2030. *Trends in Parasitology*, *40*(10), 886–895.

Soviadan, M. K. (2024). Determinants of Farmers' Participation in the Agricultural Sector Support Project for the Adoption of Improved Technology in Traditional Poultry Farming: Evidence from Rural Togo. *Journal of Agriculture and Environment for International Development (JAEID)*.

Suri, T., Aker, J., Batista, C., Callen, M., Ghani, T., Jack, W., Klapper, L., Riley, E., Schaner, S., & Sukhtankar, S. (2023). Mobile money. *VoxDevLit*, *2*(2), 3.

Survey, H., & Report, K. I. (2022). *No Title*.

Syamsu, S., Ansar, M. C., & Nurlinah. (2025). Impact of class configuration on political participation: Evidence from Gowa Regency, Indonesia. *Frontiers in Political Science*, *7*, 1544614.

Takeshima, H., & Liverpool-Tasie, L. S. O. (2015). Fertilizer subsidies, political influence and local food prices in sub-Saharan Africa: Evidence from Nigeria. *Food Policy*, *54*, 11–24.

Tefera, T., Elias, E., & Van Beek, C. (2020). Determinants of smallholder farmers' decisions on fertilizer use for cereal crops in the Ethiopian highlands. *Experimental Agriculture*, *56*(5), 677–687.

Tengapoe, K., Baddianaah, I., & Yaradua, A. S. (2024). Access to social capital and smallholder agricultural practices: the case of smallholder farmers in North-Western Ghana. *Cogent Food & Agriculture*, *10*(1), 2353670.

Terefe, A. T., & Ahmed, M. H. (2016). Driving force of organic fertilizer use in Central Rift Valley of Ethiopia: Independent double hurdle approach. *Ekonomika Poljoprivrede*, *63*(4), 1265–1279.

Tetteh, S., Leeuwis, C., Macnaghten, P., Freeman, C., Maat, H., Bindraban, P., & Doukkali, R. (2025). Under farmers' eyes: understanding differential access to subsidized fertilizers in Ghana. *Nutrient Cycling in Agroecosystems*, 1–19.

Teye, J. K., & Nikoi, E. (2023). Political settlements and the management of cocoa value chain in Ghana. *Journal of Asian and African Studies*, *58*(6), 846–863.

Theocharis, Y., Boulianne, S., Koc-Michalska, K., & Bimber, B. (2023). Platform affordances and political participation: how social media reshape political engagement. *West European Politics*, *46*(4), 788–811.

Theocharis, Y., & Van Deth, J. W. (2017). *Political participation in a changing world: Conceptual and empirical challenges in the study of citizen engagement*. Routledge.

Theocharis, Y., & Van Deth, J. W. (2018). The continuous expansion of citizen participation: A new taxonomy. *European Political Science Review*, *10*(1), 139–163. https://doi.org/10.1017/S1755773916000230

Ubink, J. (2018). Customary legal empowerment in Namibia and Ghana? Lessons about access, power and participation in non-state justice systems. *Development and Change*, *49*(4), 930–950.

Udemezue, J. C., & Oforle, E. O. (2019). Determinants of Political Participation among Farmers in the South East Nigeria. *Glob Acad J Agri Biosci*, *1*, 1–5.

Van de Walle, N. (2007). Meet the new boss, same as the old boss? The evolution of political clientelism in Africa. *Patrons, Clients and Policies: Patterns of Democratic Accountability and Political Competition*, *1*, 50–67.

van Deth, J. W. (2021). *What Is Political Participation?* Oxford University Press. https://doi.org/10.1093/acrefore/9780190228637.013.68

Van Deth, J. W. (2014). A conceptual map of political participation. *Acta Politica*, *49*(3), 349–367.

Verba, S., & Nie, N. H. (1987). *Participation in America: Political democracy and social equality*. University of Chicago Press.

Vercillo, S., Weis, T., & Luginaah, I. (2020). A bitter pill: smallholder responses to the new green revolution prescriptions in northern Ghana. *International Journal of Sustainable Development & World Ecology*, *27*(6), 565–575.

Vromen, A. (2016). Digital citizenship and political engagement. In *Digital citizenship and political engagement: The challenge from online campaigning and advocacy organisations* (pp. 9–49). Springer.

Wahyudi, W. (2021). Farmers social movement studies: A systematic literature review for a conceptual model. *Journal of Government and Civil Society*, *5*(2), 237–262.

Waje, S. S., Shano, B. K., Walelign, S. Z., & Kassie, W. A. (2024). The effect of agricultural information provision on smallholders' technology adoption and yield: experimental evidence from Ethiopia. *Frontiers in Sustainable Food Systems*, *8*, 1421442.

Wollburg, P., Bentze, T., Lu, Y., Udry, C., & Gollin, D. (2023). Agricultural Productivity Growth in Africa: New Evidence from Microdata. *World Bank Econ. Rev.*

Wongnaa, C. A., Abudu, A., Abdul-Rahaman, A., Akey, E. A., & Prah, S. (2023). Input credit scheme, farm productivity and food security nexus among smallholder rice farmers: evidence from North East Ghana. *Agricultural Finance Review*, *83*(4/5), 691–719.

World Bank. (2025). *The World Bank*. 1–18.

World Food Program (WFP). (2019). *Executive Board Annual performance report for 2023* (Issue June).

Yamba, S., Appiah, D. O., Pokuaa-Siaw, L., & Asante, F. (2017). Smallholder farmers' livelihood security options amidst climate variability and change in rural Ghana. *Scientifica*, *2017*(1), 1868290.

Yeandle, A. (2025). The political consequences of Africa's mobile revolution. *American Journal of Political Science*.

Yigezu, E. (2025). *mpact of off-farm participation on cereal productivity: Evidence from smallholders' farmers in the central part of Ethiopia*.

Zhang, Y. Z., Mi, Y. S., & Liu, C. J. (2024). Farmer participation in cooperatives enhances productive services in village collectives: a subjective evaluation approach. *Frontiers in Sustainable Food Systems*, *8*, 1442600.

Zhu, X., & Wang, G. (2024). Impact of agricultural cooperatives on farmers' collective action: A study based on the socio-ecological system framework. *Agriculture*, *14*(1), 96.

APPENDIX

Appendix 1

Table 6.1: Tobit Regression Results (Dependent variable: Input Expenditure)

Variable	Coef. / (SE)
Political Participation	0.2129*** (0.0737)
Household size	0.0175 (0.0146)
Age of household head	−0.0033 (0.0021)
Sex of household head	0.3900*** (0.0798)
Farm size	0.2639*** (0.0353)
Years of schooling	0.0092*** (0.0025)
Locality	0.1237 (0.0914)
Distance to financial institution	0.0037 (0.0026)
Access to extension officer	−0.0216 (0.0677)
Access to motorable road	0.1373 (0.1198)
Distance to market	−0.0199 (0.0669)
Asset ownership	−0.3916 (0.5196)
Public employee	0.3603* (0.2151)
Private employee	0.0934 (0.1722)
Self-employed (non-agricultural)	0.3259** (0.1573)
Self-employed (agricultural)	0.4838*** (0.1543)
Unemployed	0.1688 (0.1437)

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

Table 6.1: Continued

Variable	Coef. / (SE)
Retired	−0.6105 (0.8271)
Central	−0.1254 (0.1470)
Volta	−0.4774*** (0.1496)
Eastern	−0.4561*** (0.1348)
Ashanti	−0.5076*** (0.1630)
Brong-Ahafo	−0.4750*** (0.1355)
Northern	−0.5050*** (0.1505)
Upper East	−0.5789*** (0.1324)
Upper West	−0.9146*** (0.1529)
Inverse Mills ratio (_mill)	−3.6708*** (0.6272)
Constant	5.5459*** (0.5760)
Sigma	2.2816*** (0.0219)

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

Appendix 2

Table 6.2: Falsification Test of ESR – Labour Productivity

Variable	Coefficient (SE)
Voted in 2016	0.03285 (0.1228)
Household Size	-0.09150*** (0.0221)
Age Household Head	0.00087 (0.0029)
Sex Household Head	0.26112* (0.1308)
Farm Size	0.000052 (0.000029)
locality	-0.07177 (0.1849)
Years School	-0.00567 (0.0037)
Marital Status	-0.00896 (0.1208)
Access to Extension Officer	-0.06023 (0.1116)
Distance to Financial Institution	-0.00211 (0.00495)
Input Expenditure	0.0000677*** (0.0000174)
Public Employee	-0.06038 (0.5643)
Private-Employee	-0.35905 (0.2624)
Self-Employed (non-Agric)	-0.22355 (0.2474)
Self-Employed (Agric)	0.31208* (0.1657)
Unemployed	-0.23675 (0.1894)
Retired	0.84276 (0.5607)

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

Table 6.2: (Continued)

Variable	Coefficient (SE)
Western	-0.33468 (0.2009)
Greater Accra	-0.08219 (0.5593)
Central	-0.15696 (0.2278)
Volta	-0.29011 (0.2472)
Eastern	-0.16457 (0.2330)
Ashanti	0.00296 (0.2475)
Brong Ahafo	0.03084 (0.2062)
Northern	-0.40730* (0.2362)
Upper East	-1.37638*** (0.2241)
Contant	4.65852*** (0.3304)

turnitin Page 1 of 161 - Cover Page Submission ID trn:oid:::1:3476858863

Koka Alexander Kolog

EFFECTS OF FARMER PARTICIPATION IN POLITICS ON INPUT EXPENDITURE AND AGRICULTURAL LABOUR PRODUC...

Quick Submit

Quick Submit

University for Development Studies

Document Details

Submission ID
trn:oid:::1:3476858863

Submission Date
Feb 11, 2026, 12:22 PM GMT

Download Date
Feb 11, 2026, 12:32 PM GMT

File Name
GHM_FINALEDITED_THESES.docx

File Size
879.0 KB

146 Pages

29,741 Words

181,445 Characters

turnitin Page 1 of 161 - Cover Page Submission ID trn:oid:::1:3476858863

turnitin Page 2 of 140 - AI Writing Overview Submission ID

*% detected as AI

AI detection includes the possibility of false positives. Although some text in this submission is likely AI generated, scores below the 20% threshold are not surfaced because they have a higher likelihood of false positives.

Caution: Review required.

It is essential to understand the limitations of AI detection before making decisions about a student's work. We encourage you to learn more about Turnitin's AI detection capabilities before using the tool.

Disclaimer

Our AI writing assessment is designed to help educators identify text that might be prepared by a generative AI tool. Our AI writing assessment may not always be accurate (i.e., our AI models may produce either false positive results or false negative results), so it should not be used as the sole basis for adverse actions against a student. It takes further scrutiny and human judgment in conjunction with an organization's application of its specific academic policies to determine whether any academic misconduct has occurred.

Frequently Asked Questions

How should I interpret Turnitin's AI writing percentage and false positives?

The percentage shown in the AI writing report is the amount of qualifying text within the submission that Turnitin's AI writing detection model determines was either likely AI-generated text from a large language model or likely AI-generated text that was likely revised using an AI paraphrase tool or word spinner.

False positives (incorrectly flagging human-written text as AI-generated) are a possibility in AI models.

AI detection scores under 20%, which we do not surface in new reports, have a higher likelihood of false positives. To reduce the likelihood of misinterpretation, no score or highlights are attributed and are indicated with an asterisk in the report (*%).

The AI writing percentage should not be the sole basis to determine whether misconduct has occurred. The reviewer/instructor should use the percentage as a means to start a formative conversation with their student and/or use it to examine the submitted assignment in accordance with their school's policies.

What does 'qualifying text' mean?

Our model only processes qualifying text in the form of long-form writing. Long-form writing means individual sentences contained in paragraphs that make up a longer piece of written work, such as an essay, a dissertation, or an article, etc. Qualifying text that has been determined to be likely AI-generated will be highlighted in cyan in the submission, and likely AI-generated and then likely AI-paraphrased will be highlighted purple.

Non-qualifying text, such as bullet points, annotated bibliographies, etc., will not be processed and can create disparity between the submission highlights and the percentage shown.

turnitin Page 2 of 140 - AI Writing Overview Submission ID