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THE PARTICIPATION OF PERSONS WITH DISABILITIES IN AGRICULTURE AND ITS EFFECTS ON THEIR FOOD SECURITY SITUATION IN THE SAVELUGU-NANTON MUNICIPALITY

AYISHA GOMDA

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BY

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A THESIS SUBMITTED TO THE DEPARTMENT OF AGRICULTURAL EXTENSION, RURAL DEVELOPMENT AND GENDER STUDIES, UNIVERSITY FOR DEVELOPMENT STUDIES, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF PHILOSOPHY DEGREE IN INNOVATION COMMUNICATION.

JANUARY, 2018

DECLARATION

Student

I hereby declare that this thesis is the result of my own original work and that no part of it has been presented for another degree in this University or elsewhere:

Candidate's Signature: ……...…… Date: ……..……

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Supervisors

I hereby declare that the preparation and presentation of the thesis was supervised in accordance with the guidelines on supervision of dissertation/thesis laid down by the University for Development Studies.

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ABSTRACT

The role of Persons With Disabilities (PWDs) in agriculture has long been acknowledged worldwide, but it is yet to receive commensurate research and policy attention in Ghana. This study therefore sought to highlight the participation of PWDs' in agriculture in the Savelugu-Nanton Municipality and its effects on their food security situation. The study employed descriptive survey design to collect mainly primary data from disabled farmers and extension officers across the Municipality. From the list of PWDs in the Municipality, a multi-stage sampling technique was employed to sample 156 disabled farmers. Descriptive and inferential statistics were employed in analysing the data collected, with probit regression applied in identifying determinants of effective participation of PWDs in agriculture. Household Food Insecurity Access Scale (HFIAS) was applied in measuring household food insecurity situation of PWDs. Also, Kendall's coefficient of concordance was used to determine the constraints PWDs face in agriculture. Results of the study found that PWDs in the Municipality mainly engage in food crop farming as well as livestock rearing. The study identified two forms of participation of PWDs in agriculture. These are, 'participation through labour contribution' and participation through decision making'. The study also revealed that extension services delivery in the Municipality does not address the peculiar needs of disabled farmers. Age, sex, education, household size, access to labour, membership of FBO, power in household decision making and farm size were found as significant determinants of PWDs' effective participation in agriculture. The study found no significant relationship between type of disability and PWDs participation in agriculture at 5% level of significance. The HFIAS score reveals high level of food insecurity among PWDs. However, the study found significant relationship between form of participation in

agriculture and household food security situation of PWDs. Constraints to PWDs participation in agriculture include unavailability of extension officers, societal prejudice, among others. The study recommends the mainstreaming of concerns of PWDs in agriculture in order to ensure an all-inclusive agricultural services provision.

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LIST OF ABBREVIATIONS

CBM	Christian Blind Mission
CUTS	Consumer Unity and Trust Society
DACF	District Assemblies Common Fund
DESA	Department of Economic and Social Affairs
DFID	Department for International Development
DPOs	Disabled Persons Organisations
FAO	Food and Agricultural Organisation
FBOs	Farmer Based Organisations
GES	Ghana Education Service
GFD	Ghana Federation of the Disabled
GoG	Government of Ghana
GSS	Ghana Statistical Service
HRW	Human Rights Watch
ICCO	Interchurch Coordination Committee Development Aid
ICF	International Classification of Functioning Disability and Health
ILO	International Labour Organisation
LMICs	Low and Middle Income Countries
MADU	Municipal Agricultural Development Unit
MMDAs	Metropolitan, Municipal and District Assemblies
MOFA	Ministry of Food and Agriculture
MOH	Ministry of Health
MOTI	Ministry of Trade and Industry
NAEP	National Agricultural Extension Project
NCPD	National Council on Persons with Disabilities
NDP	National Disability Policy

NGOs	Non-Governmental Organisations
PPME	Policy, Planning, Monitoring and Evaluation
PWDs	Persons/People With Disabilities
SNMA	Savelugu-Nanton Municipal Assembly
UN	United Nations
UNCRPD	United Nations Convention on the Rights of Persons with Disabilities
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNICEF	United Nations Children's Fund
UPIAS	Union of the Physically Impaired Against Segregation
US	United States
WFP	World Food Programme
WHO	World Health Organisation

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Throughout recorded history, Persons With Disabilities (PWDs) have been regarded as one of the world's most significant minorities and are often subjected to marginalization and negative representation (FAO, 2006; Ghosh, 2012; & Musuruve, Inimah, Mukulu, & Mathooko, 2012).

Since the United Nations adopted the Convention on the Right of Persons with Disabilities in 2006, global recognition has been drawn on the need to integrate disability issues in development planning processes (UNCRPD, 2006). Article 32 of the UN Convention on the Rights of Persons with Disabilities (UNCRPD, 2006) obliges states, to include PWDs in all development programmes thereby promoting and fulfilling the rights and dignity of PWDs (UNCRPD, 2006). The UNCRPD affirms the dignity and human rights of all Persons With Disabilities and rejects the link between disability and impairment (Groce, Kett, Lang, & Trani, 2011). The UNCRPD gives Persons With Disabilities a right to access education, rehabilitation and health services, as well as the right to access work and employment on an equal basis with others. This shifts the query from why should PWDs be included, to how should PWDs be included in development projects (Schulze, 2010; WHO, 2011; & Wapling & Downie, 2012).

The World Health Organization report on Disability (WHO, 2011), estimates that: more than one billion people live with a disability in one form or the other and this constitutes about 15% of the world's population. A similar global figure of 14% was found by Mitra and Sambamoorthi (2014).

The report further indicates that 110 million people, constituting 2.2% of the global population have severe functional difficulties and that 80% of People With Disabilities live in developing countries. Also about 20%, representing 1 in 5 of the poorest people living in developing countries have a disability and that only 41.7% of women with disabilities have completed primary school compared to 52.9% for men (WHO, 2011).

Ghana has a disability population of about 7-10% (UNDP, 2007). The Ghana Statistical Service however, estimated in the 2010 Population and Housing Census that there are 737,743 persons with some form of disability, representing 3% of the total population (GSS, 2012). According to Ministry of Health however, there is a growing trend in the number of PWDs in Ghana (MOH/PPME, 2007).

The Ghana National Disability Policy (NDP) document shows that, there are more women with disabilities than men in Ghana (NDP, 2000). There is however, variations in terms of the type of disability found in Ghana. The blind/visually impaired constitute the highest proportion of PWDs found in Ghana with 59% for females and 55% for males. The physically disabled represents the second largest category of PWDs. Persons with learning disabilities is in the third category with 14% for females and 13% for males. The deaf/hearing impaired also constitutes 11% for males and 10% females (Mensah, Williams, Atta-Ankomah & Mjomba, 2008).

Women with disabilities often experience double discrimination due to the intersection of gender and disability (Groce *et al.*, 2011). For Ghanaian women with disabilities, the situation is more complicated, given the intersection of disability, gender, poverty, cultural beliefs and practices, negative perceptions about their capabilities, and geographic area (DESA, 2011; DFID, 2000; Banks & Polack, 2013;

WHO, 2011; HRW, 2012; The Disabled Women's Network, 2007; & Ortoleva & Lewis, 2012).

Disability does not essentially suggest limited well-being and poverty. There is however, growing evidence that disability and poverty are highly correlated, especially multi-dimensional poverty (Groce *et al.*, 2011**)**. Disability is both a cause and consequence of poverty, and poverty and disability reinforce each other, contributing to increased vulnerability and exclusion. This implies that, Poverty creates disability and disability creates poverty. While not all People With Disabilities are poor, it is increasingly recognised that disability is an important issue in poverty reduction and poverty alleviation efforts. Poverty increases the likelihood of disability, thus, chronically poor people are often at risk of ill health and injuries, which may lead to several forms of disabilities (Mitra, Posarac, & Vick, 2013; DFID, 2000; Trani & Loeb, 2012; & Bruijin, 2014).

Agriculture is regarded as the second biggest employment sector world-wide (FAO, 2013). There are over 1 billion people employed in agriculture the world over, representing 1 in every 3 workers (ILO, 2015). Agriculture is a key sector of Ghana's economy, accounting for about 20% of the national GDP in 2016 (Bagbara, 2017 & GoG, 2017).

Although about 60% of sub-Saharan Africans are engaged in agriculture and 35% globally, PWDs are often excluded from agricultural employment opportunities (FAO, 2013).

The World Food Summit organized by FAO acknowledged the fundamental contribution to food security by disabled farmers, noting that a large proportion of the

disabled people were farmers with responsibility for the food security of their households (FAO, 2006).

Also, the causes of disability are often directly related to food insecurity, resulting in malnutrition. Nutrition and disability are critical human rights issues as spelled out in article 25 of the Universal Declaration of Human Rights and the General Comment on the Right to Food, which specifically spells out the rights of PWDs to have physical access to adequate food (Groce, Challenger, & Kerac, 2013).

In most societies in Africa, growing space, land tenure and capital to invest in agriculture such as tools and seeds, may be limited to only persons without disabilities (Leonard Cheshire Disability, 2013 & WHO, 2011). In addition, agriculture extension and financial services such as microcredit might not be accessible to PWDs to enable them engage in agricultural production. In countries where preparing and selling food is one of the few avenues for women to earn money outside the household, prejudice against PWDs may limit their ability to sell farm produce or food. This is a major barrier for women with disabilities (Heymann, Stein, & Moreno, 2014; Mitra *et al.*, 2013; Leonard Cheshire Disability, 2013; & New Agriculturist, 2013).

The International Labour Organization estimates economic losses related to the exclusion of People With Disabilities from the labour force to be between 3-7% of the GDP of African countries (Buckup, 2009). An estimated 80% of economically active PWDs in developing countries are self-employed, as this is often their only option (Leymat, 2012; Groce *et al.*, 2011; Banks & Polack, 2014; & Mizunoya & Mitra, 2013).

This clearly shows that, there needs to be greater participation of PWDs in the development agenda of Ghana. National developmental policies and interventions should tackle the needs of PWDs especially those who dwell in rural areas where poverty and food insecurity are of great concern.

1.2 Problem Statement

Various studies have shown that disabled people can be productive members of their societies (Bruijin, 2014). Productive and decent work enables People With Disabilities to realize their aspirations, improve their living conditions and participate more actively in society (Leonard Cheshire Disability, 2013 & New Agriculturist, 2013).

Over the years, there have been various International Declarations and Conventions which seek to protect the Fundamental Human Rights of Persons With Disabilities. The UN Declaration on Human Rights (1948), the UN Standard Rules on the Equalization of Opportunities for PWDs (1993), the UN Convention on the Rights of PWDs (2006), the African Charter on Human and People's Rights and the African Decade of the Disabled (2000-2009) all pursue the aim of safeguarding the rights of PWDs (Mensah *et al.*, 2008).

In the Ghanaian context, the Fourth Republican Constitution of (1992), PWDs Act (2006), the Children's Act (1998), the Labour Act (2003) and the National Disability Policy (2000) provide for the equal right of PWDs to education, healthcare, employment, and decent social life. PWDs, who engage in business and employers who employ PWDs, are also guaranteed some special incentives under the 1992 Constitution (Mensah *et al.*, 2008).

In addition, National Disability Policy seeks to address the needs of PWDs to receive the appropriate training and necessary support services to increase their capabilities to deal with the challenges in life in a dignified manner. The National Disability Policy has as one of its long term goals, the mainstreaming of all PWDs into the development process and improving their quality of life through the equalization of opportunities by the year 2020 (NDP, 2000).

Also, PWDs are entitled to 2% share in the District Assemblies Common Fund (DACF) which is disbursed by the Common Fund Administrator to Metropolitan, Municipal and District Assemblies (MMDAs) (NCPD/GFD, 2010).

However, it appears that Ghana has no precise policy direction targeting the participation of PWDs in agriculture. Considering the fact that, agriculture is the main source of livelihood for about 56% of the active labour force of Ghana (New agriculturist, 2013), especially those residing in rural areas, it is expected that PWDs who are considered as the poorest of the poor, will also obtain their livelihood from agriculture (FAO, 2015). Considering the various physical, institutional, attitudinal as well as internalized barriers faced by PWDs, unless a deliberate agricultural policy intervention, aimed at addressing the constraints and challenges limiting the participation of PWDs in agriculture is formulated, the full contribution of PWDs to Ghana's agricultural development will not be realized.

The lack of express agricultural policy relating to the needs of PWDs in agriculture could be due to lack of information on participation of PWDs in agriculture and factors which influence their effective engagement in agriculture. The needs and challenges of PWDs have not been brought to the forefront of national discourse in order to attract the needed attention of policy makers. Also, the needed knowledge

and awareness about factors that influence the participation of PWDs in agriculture is lacking. As such, formulating policies and programmes to encourage participation of PWDs in agriculture is a big challenge.

More so, very little research has been done in Ghana to highlight and project the needs and constraints of PWDs in agriculture. Thus, policy formulation is not likely to capture the concerns of PWDs.

This has created an obvious knowledge gap which has to be bridged through empirical studies. This study therefore sought to explore the participation of PWDs in agriculture and its effects on their food security situation in the Savelugu-Nanton Municipality.

1.3 Research Questions

Main Research Question

The main research question of the study is;

What are the factors influencing the participation of PWDs in agriculture and what effect does it have on their food security situation in the Savelugu-Nanton Municipality?

Specific Research Questions

1. What is the nature and extent of participation of PWDs in agriculture in the Municipality?
2. To what extent do agricultural service providers in the Municipality incorporate the concerns of PWDs in their service delivery and how does the delivery of agricultural services in the Municipality influence PWDs access to these services?

3. What are the factors determining the participation of PWDs in agriculture in the Municipality and to what extent does the participation of PWDs' in agriculture influence their food security situation?
4. What are the constraints to the participation of PWDs in agriculture in the Municipality?

1.4 Research Objectives

Main Objective

The main objective of the study is to explore the factors influencing the participation of PWDs in agriculture and its effects on their food security situation in the Savelugu-Nanton Municipality.

Specific Objectives

1. To examine the nature and extent of participation of PWDs in agriculture in the Municipality.
2. To examine the extent to which agricultural services providers incorporate the concerns of PWDs in their service delivery and how the delivery of agricultural services influence PWDs' access to these services.
3. To analyse the factors determining the participation of PWDs in agriculture and the influence it has on their food security situation in the Municipality.
4. To analyse the constraints to PWDs' participation in agriculture in the Municipality.

1.5 Justification

Findings of this study which explored the participation of PWDs in agriculture and its effect on food security will first and foremost add to knowledge. The study also provides useful information to guide activities of researchers, development

practitioners, social welfare workers and agricultural service providers working to improve the welfare of PWDs. Another relevance of this study is that, policy makers and development practitioners can utilize information on the needs and constraints of PWDs to help guide policy formulation. Policy makers can then formulate policies that are conscious of the peculiar needs and constraints faced by PWDs. This information and awareness will also highlight the need for the promulgation of a national policy on PWDs participation in agriculture similar to what has been done for women in agriculture. The Ministry of Food and Agriculture has a gender desk that is tasked with the responsibility of dealing with women's issues with regards to access to land, labour, credit and other productive resources. A similar avenue can be created for PWDs.

In addition, if agricultural service providers get to know more about the needs and constraints faced by PWDs, they can incorporate these concerns to guide their agricultural service delivery approach. This will go a long way to ensure that the needs and concerns of PWDs are taken into consideration in whatever intervention they intend to deliver to farmers.

1.6 Scope

Geographically, the study covered the Savelugu-Nanton Municipal area. The study also reviewed literature on the following concepts: definition of disability, the models of disability, the current state of Persons With Disabilities in relation to access to social services and the link between agricultural productivity and Persons With Disabilities. The focus of the study is the participation of PWDs in agriculture and, as such, only issues relating to agriculture were thoroughly examined. Other livelihood and economic activities which PWDs engage in were not given prominence here,

except when there are related to agriculture or contribute to their food security situation.

1.7 Operational Definition of Terms

For this study, effective participation of PWDs in agriculture is defined as disabled farmers who have power in taking decisions regarding what to produce, how to produce and market it and how to utilize the income.

Table 1.1 Definitions of Terms

Term	Definition
Persons With Disabilities	This refers to persons who have physical or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others (UNCRPD, 2006).
Not actively participating in agriculture.	Engaged in agricultural activities but are not involved in the decision on production and marketing activities.
Actively participating in agricultural activities	Engaged in making decision on production and marketing of agricultural produce.
Very actively participating in agricultural activities	Fully engaged in both agricultural activities and decision on agricultural production and marketing.
Physical Impairment	Physical impairment is a disability that limits a person's physical capacity to move, coordinate actions, or perform physical activities (US Legal, 2016).

Term	Definition
Sensory Impairment	Sensory impairment refers to damage that occurs to the structure of the eyes or ears affecting the normal functioning of vision and hearing senses (Senses Australia, 2016).

Source: Author, 2016

1.8 Organisation of the Study

The report is made up of five chapters. The first chapter forms the introduction. This consists of a general background to the study, the problem statement, and justification of the study, research questions and objectives, scope of the study and organization of the study. The second chapter presents literature on concepts appropriate to the study such as the definition of disability, conceptual models of disability, PWDs access to agricultural services and the crucial role of disabled farmers to food security. Chapter three discusses the methodology of the study, whiles chapter four presents the results and discussions. The conclusions and recommendations are presented in chapter five.

1.9 Limitations of the Study

The current study was limited to only the Savelugu-Nanton Municipality of the Northern Region of Ghana. It was further limited to a PWD sample of 156 disabled farmers in the Municipality who were sampled from the six administrative zones of the Municipality. The concerns raised may be peculiar to the Savelugu-Nanton Municipality. This limitation could reduce the validity, reliability and generalizability of the study findings.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature relating to determinants of participation of PWDs in agriculture. It also traces the definition of disability from the International Classification of Functioning Disability and Health (ICF) by the WHO (2001) to the United Nations Convention on the Rights of Persons with Disabilities (2006). PWDs access to social services like education and employment are explored in other to create a broader context of the situation of PWDs. It is worth noting that, there is not much literature specifically addressing the factors determining the participation of PWDs in agriculture. This alone shows the level of marginalization of PWDs in relation to their access to social and agricultural services. Thus, the literature dwells largely on PWDs access to social services. This shows that, the level of deprivation faced by PWDs in their access to social services also relates to PWDs access to agricultural services like extension delivery, agricultural information and access to credit.

2.2 Definition of Disability

Defining disability can be complicated due to its complex, dynamic, multidimensional and contested nature (Mitra, 2006, & WHO, 2011). Various definitions have been given by different schools of thought from historical and social perspectives about what disability entails. There is, however, no standard definition of disability (Mitra, 2006).

Elwan (1999) sees disability as a relative term that describes the restriction of the ability to perform a normal human activity.

The International Classification of Functioning Disability and Health (ICF) by the WHO, provides a broad framework for the categorization of health related wellbeing of populations (WHO, 2001).

The WHO describes disability as being a socially constructed situation in the sense that, disability is not an attribute of an individual, but rather a complex collection of conditions, many of which are created by the social environment. Hence the management of the problem requires social action, and it is the collective responsibility of society at large to make the environmental modifications necessary for the full participation of People With Disabilities in all areas of social life. The issue is therefore an attitudinal or ideological one requiring social change, which at the political level becomes a question of human rights (WHO, 2001).

The ICF categorised disabilities under two broad categories namely, (a) body functions and structures (b) activities and participation (Dahl, 2002). This information on diagnosis plus functioning provides a broader and more meaningful picture of the health of people or populations, which is a vital tool for decision-making purposes (WHO, 2001, & Dahl, 2002). One key feature of the ICF is that it recognizes the important role of environmental factors in people's functioning. These factors range from physical factors such as climate, terrain or building design to social factors such as attitudes, institutions, and laws (Dahl, 2002). This interaction with environmental factors is an essential aspect of the scientific understanding of 'functioning and disability' (WHO, 2001).

The ICF theorises a person's level of functioning as a dynamic interaction between her or his health conditions, environmental factors, and personal factors. It is an integrated model of disability, based on the social and medical models of disability in

the sense that, disability is multidimensional and interactive (WHO, 2001). The ICF definition of disability can only be understood in the context of health. This implies that, participation restrictions related to other factors, as racial prejudice and other forms of discrimination, are not within the scope of the ICF (WHO, 2001).

The UN Convention on the Rights of PWDs (UNCRPD) affirms the dignity and human rights of all Persons With Disabilities and rejects the link between disability and impairment (WHO, 2011). The UNCPRD recognizes the fact that 'disability is an evolving concept' and adopts the following definition (UNCRPD, 2006):

> *''Persons with Disabilities include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others'' (UNCRPD, 2006, p.4).*

This unsolidified definition of disability accommodates different understandings of disability or impairment (Schulze, 2010). As Al Ju'beh (2015) notes, impairments on their own would not lead to disability should there be a completely inclusive and comprehensively accessible environment. This inclusive environment can be achieved by addressing attitudinal barriers such as stereotypes, prejudices and other forms of paternalistic and patronising treatment (Al Ju'beh, 2015, & Schulze, 2010).

2.3 Access to Social Services by PWDs

In recent years, disability issues have become synonymous with human rights and this has led to an increased emphasis on the principle of non-discrimination in terms of access to basic social services (Ghosh, 2012).

A study by DFID (2000) concluded that, due to inaccessible infrastructure, inaccessible education, inability to secure micro credit and lack of skills development initiatives, disabled people are often excluded from development interventions.

The UN estimates that about 20% of PWDs live on less than $1 a day (WHO, 2011). In addition, about 82% of PWDs in developing countries find themselves living below the poverty line and are among the most vulnerable and marginalised (WHO, 2011). In addition, women with disabilities face more difficult challenges than their male counterparts or non-disabled women in their quest to earn a living (O' Reilly, 2007). Studies by Mizunoya and Mitra (2013) have highlighted the fact that, there is a statistically significant gap between employment rates of disabled persons compared to their non-disabled counterparts.

2.3.1 Access to Education for PWDs

Studies all over the world have shown that children and adults with disabilities are more likely to be out of school compared to their non-disabled counterparts (Groce *et al*., 2011; Banks & Polack, 2014; Groce & Kett, 2014; Walker, 2017; & WHO, 2011). A multitude of factors such as coming from an ultra-poor household, being female or suffering from a particular condition culminate in disabled children not being able to attain education (Le Fanu, 2014, & Wapling, 2016).

Statistics in Ghana show that only 6% of the population of children with disabilities receives any form of education. The remaining 94% are likely not to ever receive any education at all (GES, 2004).

These instances of segregation of children with disabilities from attaining education mark the beginning of their exclusion and marginalisation in society.

Children with disabilities are denied decent employment opportunities later in life due to the minimal skills they possess. Also, they are unable to participate and contribute meaningfully in society which further enhances their inability to contribute to developmental interventions and initiatives.

In recent times, the focus has been placed on the removal of barriers to education for all children by promoting inclusive education (Wapling, 2016). This has highlighted the role of education in promoting social justice for all especially disabled people (Miles & Singal, 2009). Quality, inclusive and equitable education for all is the sure way of uplifting Persons With Disabilities out of poverty, vulnerability and exclusion. In other to achieve this, the international community has come out with certain human rights frameworks that seek to ensure that children with disabilities receive quality education in an inclusive environment. The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), which was adopted in 2006, seeks to establish the role of inclusive education as the key mechanism to ensuring that, disabled children have a right to education (WHO, 2011 & UNCRPD, 2006). This would be possible if children with disabilities are included in the general education system. Article 24 of the UNCRPD establishes the right to education for People With Disabilities by ensuring equal access to an "inclusive education system at all levels" and providing reasonable accommodation and individual support services to Persons With Disabilities to facilitate their education (Banks & Polack, 2014, & WHO, 2011).

Discussion of inclusive education would be incomplete without making mention of the Salamanca framework (1994), which encouraged governments to accommodate all children regardless of their conditions or impairments, by putting a stop to the segregation of children with special needs (Wapling, 2016). The framework drew attention to the fact that, a multitude of factors ranging from ethnicity, poor language

articulation and poverty could potentially impact a child's learning ability hence, inclusive education is necessary to ensure that all children are accommodated in the educational set up (Kiuppis, 2014). The Salamanca framework broadened the discourse around education to look at ways in which the system was set up and the barriers that prevented children from accessing education (Wapling, 2016). Inclusive education, as it emerged from the Salamanca framework, took on two main themes; a shift away from the assumptions that the educational needs of children are based on medically diagnosed conditions or impairments; and how to enhance a barrier free learning environment through the transformation of mainstream educational systems (Kiuppis, 2014).

As efforts were being made to transform special education into what is now known as Inclusive Education, another agenda known as Education For All (EFA) emerged in the development sphere. It was born out of the World Summit on Education for All which was later framed into the Millennium Development Goal of achieving education for all by 2015 (Kalyanpur, 2011, & UNESCO, 2000). By extension, the Sustainable Development Goal 4 on education aims to ensure inclusive and equitable quality education and promote lifelong learning for all (Osborn, Cutter, & Ullah, 2015). Although these two educational agendas were championed by UNESCO, a further probe reveals that, much of the programmes of the EFA have not taken into account the needs of vulnerable children including children with disabilities (Miles & Singal, 2009).

The EFA and inclusive education agendas have continued to operate parallel to each other although they appear synonymous (Wapling, 2016). This situation has created a major setback in educational attainment of many developing countries.

In other to ensure that children with disabilities participate and benefit from education, there is the need to alleviate the effects of barriers that hinder their full participation. Most schools are constructed without considering the needs of disabled children. Some of the challenges disabled children face include, narrow doorways, multiple storeys without ramps or lifts, and inaccessible toilet facilities (Banks & Polack, 2014). This is especially critical for children who have physical impairments.

The few schools that comply with the standards for accessibility for PWDs are usually the special schools which are situated in urban areas. This implies that, the majority of disabled children, who reside in rural areas, are deprived from attaining education due to transportation challenges. There is also the need to ensure that the mode of communication is well suited for the needs of disabled children. Most schools are under-resourced with regards to teaching and learning materials, such as materials in Braille, large print, and pictorial, audio or sign-language varieties. This goes on to further exclude children with disabilities from the learning process (Banks & Polack, 2014, & Groce & Kett, 2014).

In addition, prejudicial attitudes and misconceptions about disability make it difficult for individuals with disabilities to attain education on an equal basis with their non-disabled counterparts (Banks & Polack, 2014). In many societies, disabled persons are prevented from attaining education due to the belief that, disabled children are an embarrassment to their families and should not be made to attend school (Groce & Kett, 2014).

Children with disabilities tend to suffer from bullying and mistreatment from their peers and teachers which lowers their self-esteem and may cause them to drop out of school.

For women and girls with disabilities, the situation is further worsened due to certain cultural biases against women (Russo, 2003, & Groce & Kett, 2014).

In many societies, limited resources are provided to cater for the education of girls with disabilities due to the low level of expectations from parents and teachers (Groce & Kett, 2013).

In some instances, where disabled youth are able to attain basic education, they tend to be restricted in the kind of courses they are allowed to pursue (Groce & Kett, 2014, & Banks & Polack, 2014). As noted by Shevlin, Kenny and McNeela (2002), in advanced countries such as Ireland and China, students with disabilities are not allowed to access science related courses based on the perception that, a disabled student may 'waste' the degree due to his/her inability to work. This goes on to further worsen the plight of disabled persons. Disabled youth especially, find it extremely difficult to undertake apprentice or job training that will equip them for the job market (Groce & Kett, 2014).

Another area of concern is the policy and institutional framework surrounding the management of education. In many countries, special education tends to fall under the jurisdiction of the Ministry of Health or social welfare rather than the Ministry of Education (Groce & Kett, 2014, & WHO, 2011). This implies that, governmental efforts and allocations targeting the educational needs of Persons With Disabilities are managed by different governmental agencies which further segregate disabled persons (Groce & Kett, 2014, & UNESCO, 2009). International and national incentive schemes such as School Feeding Programmes are implemented to enhance enrolment and school attendance (Bundy, Burbano, Grosh, Gelli, Jukes, & Drake, 2009). However, no such interventions are put in place to target disabled children.

The link between educational attainment and the prospects of brighter job opportunities have been researched and established (Hanushek & WöBmann, 2007, & Bakhshi, Kett & Oliver, 2013).

By extension, PWDs, who are considered as the poorest of the poor have an even greater need for educational opportunities. Studies in developed and developing countries have established a strong link between the wellbeing of disabled persons and their households and higher educational attainment (Filmer, 2008, & WHO, 2011). A study conducted by Filmer (2008) across 13 Low and Middle Income Countries (LMICs) showed that, the probability of a disabled person and his/her household belonging to the poorest two quintiles was reduced by 2-5% with each additional year of schooling. In addition, studies in Nepal and China, point to the fact that, wage returns from education for disabled people and their households is relatively substantial (Lamichhane, 2013, & Liao & Zhao, 2013).

It is worth noting that, disability data on discrimination with regards to access to education is minimal and this poses a challenge for the international community to effectively monitor the situation of young and old persons with disability (WHO, 2011, & UNESCO, 2015). Article 31 of the CRPD unequivocally acknowledges the need for more vigorous and regular data collection on policies and interventions in other to track the progress of these interventions in countries that have ratified or adopted the CRPD (Groce *et al.*, 2011).

In most instances, children with disabilities are not likely to be counted in official census or surveys and this further contributes to the gross underestimation of the exclusion of children with disabilities (Banks & Polack, 2014). This has also made it

difficult to avoid selection biases in estimating the returns to education for People With Disabilities (Hanushek & WöBmann, 2007 & Gauri, 2004).

2.3.2 PWDs Access to Employment

In recent times, the world economic crisis has resulted in a lot of workers losing their jobs. Industries and institutions have reinforced their requirements and job specifications; hence disadvantaged groups such as PWDs face an even greater challenge in accessing job opportunities (Turmusani, 2012). In South Africa for instance, the rate of employment for disabled people is less than one third of their non-disabled counterparts (Durie & Wilson, 2007).

Growing inequality in access to economic resources has made the rich grow richer and the poor left poorer and marginalised. Many countries are facing serious challenges with increasing income inequality with regards to salaries and wages as explained by Gurria (2011). As Stiglitz (2012) notes, the vulnerable section of society is often denied access to quality education, healthcare facilities and employment due to unequal distribution of resources. Drawing from the Indian situation, Hiranandani and Sonpal (2010) argued that, the few economic opportunities available are reserved for highly educated and skilled Persons With Disabilities whereas the majority of PWDs are left out of the Indian economy.

In addition, Bhanushali (2006) studied and explored the gender dimension in relation to the participation of men and women with disabilities in the workforce. The situation for women with disabilities could be far worse given the intersection of gender, disability, cultural norms and negative perceptions about their ability to work (Disabled Women's Network, 2007).

Women with disabilities are half as likely to work as men with disabilities and also receive half the income for similar work done (Leymat, 2011).

As Barnes and Mercer (2003) note, social scientists have consistently paid little attention to critically examining the living conditions of disabled people.

Their focus has rather been on discussing the health aspects of disability. This has resulted in an obvious absence of PWDs in the industrial labour force which reinforces their exclusion (Barnes & Mercer, 2005).

The UNCRPD therefore, seeks to ensure the inclusion of PWDs in work and employment by eliminating discrimination in career advancement as well as wage setting (Article 27). This is necessary to enhance the productivity of PWDs and to make them active members of the labour force of their societies. If implemented, Article 27 of the CRPD can go a long way in improving the living conditions of PWDs throughout the world (UNCRPD, 2006).

In Ghana for instance, the Disability Law (2006) calls for the establishment of the National Council on Disability. The Council is tasked to propose and evolve policies and strategies to ensure full and equal participation of PWDs in national development (Mensah *et al.*, 2008). In addition, the Ghana Labour Law (2003) Act 651 makes provisions to safeguard the rights of PWDs in employment (Mensah *et al.*, 2008).

However, the exclusion of PWDs from employment opportunities remains widespread despite the prospective benefits of including disabled people (Banks & Polack, 2014).

Statistics from UN (2007) shows that, unemployment rates for disabled people tend to be averagely higher than non-disabled persons by 40-60%. In addition, some

estimates show that, about 80-90% of disabled people do not participate in the labour force (UN Enable, 2007).

The situation is far worse for individuals with multiple disabilities as well as those who suffer from mental and intellectual disabilities (Mizunoya & Mitra, 2013). Persons With Disabilities are more likely to be hired for jobs that have little room for advancement and require minimal training and skills.

Disabled people often get laid off earlier than their non-disabled counterparts and have few prospects for promotion and advancement (Groce & Kett, 2014, & Banks & Polack, 2014).

Despite the obvious disparity in terms of employment for disabled people, referencing employment figures could paint a misleading picture (Groce & Kett, 2014). Many studies on the employment situation of PWDs do not take into account the value of unpaid labour especially in rural areas. Research has shown that, disabled persons all over the world work in their households and farms although this may be termed officially as unemployment (Groce & Kett, 2014, & New Agriculturist, 2013).

Studies conducted in Asia, the Pacific and Africa show that disabled people plant fruit trees, cook, beg for alms, clean, baby-sit, care for aged relatives, or tend gardens, fields and flocks (New Agriculturist, 2013, & Groce, Murray, Loeb, Tramontano, Trani, & Mekonnen, 2013). Disabled people receive very little credit for their contributions to the wellbeing of their households and communities. Also, they tend to have little to no control over the money they bring home to their families (UNICEF, 2013). Despite the numerous challenges in quantifying unpaid labour, a report by the UNDP in (1995) estimated that, if unpaid labour was treated as market transactions at prevailing wages, they could yield as much as US$16 trillion (UNDP, 1995).

This amount is about 70% higher than the global output estimate of about US$ 23 trillion. This clearly shows that, concerted efforts should be put in place to ensure that more PWDs participate in unpaid work.

In other to break the vicious cycle of poverty faced by Persons With Disabilities, steps should be taken to ensure a greater inclusion of disabled people in sustainable and gainful employment opportunities. This can only be achieved if the barriers that hinder the participation of PWDs in employment are mitigated (Banks & Polack, 2014). Disabled people find it difficult to develop social networks which can propel them to gain jobs due to the societal isolation they face. It is a common belief that an employee with a disability may not be as productive as one without a disability. This assumption leads to a lot of prejudice for people with different forms of impairment (WHO, 2011 & Banks & Polack, 2014). This is evident in a study that was conducted in 27 countries that showed that about one third of persons suffering from schizophrenia reported discrimination in finding or retaining a job (Thornicroft, Brohan, Rose, Sartorius, & Leese, 2009). The contribution of these persons is left untapped and underutilised in the development of their societies. In addition, certain physical barriers such as inaccessible work environments, and legal barriers may also constrain PWDs (WHO, 2011).

In countries such as Cambodia, disabled people are not allowed to teach. The situation is quite different in Ghana, where disabled people do not face such stark discrimination based on legislation (Mensah *et al.*, 2008, & UNICEF, 2013). There is however a need to ensure that, social protection policy interventions targeting PWDs does not discourage them from seeking employment (Gentilini & Omamo, 2011). The Livelihood Empowerment Against Poverty (LEAP) intervention for instance, could be structured to support and enhance the employability of PWDs. This can go a long way

to motivate disabled people to work and not to rely solely on the income they get from the programme (WHO, 2011, & Mitra, 2005).

It is crucial to note that a large proportion of the disabled are employed in the informal sector. In many developing countries, about 80% of PWDs are self-employed as this is the only option available to them (Rohwerder, 2015). Entrepreneurship can be a catalyst to propel disabled people in developing countries where formal sector opportunities are few.

A major challenge to entrepreneurship of PWDs is inadequate access to credit to start up their businesses (Banks & Polack, 2014). Banks and micro credit schemes are reluctant to lend money to disabled people due to the perception that, Persons With Disabilities are generally poor and lack collateral to enable them secure credit (Labie, Méon, Mersland, & Szafarz, 2010, & Yeo & Moore, 2003). Evidence of this situation is found in the results of a multi-country study of 100 countries by Handicap International where it was found that, Persons With Disabilities constituted only 0-0.5% of the clientele of micro-finance organisations (Béria, *et al.*, 2007). This clearly shows that, PWDs would be unable to utilise micro- finance as an avenue to lift them out of poverty.

It is important to note that, there exists a strong link between disability and lower employment and income for both the individual with disability and their household (Banks & Polack, 2014). The inability of disabled people to work has a huge impact both at their household level and the national level. A study in Pakistan found that, rehabilitating people with incurable blindness would lead to gross aggregate gains in household earnings of US$71.8 million per year, based on the assumption of 0%

employment before rehabilitation and 100% afterwards among blind people (Awan, Khan, & Malik, 2012).

Further studies need to be conducted to specifically determine what kinds of rehabilitation interventions can be undertaken to improve the living conditions of visually impaired people in Pakistan.

Studies have shown that, disabled people have a lot to offer with regards to teamwork and loyalty among the staff of an organization (ILO, 2007). The inclusion of People With Disabilities can go a long way to improve diversity and boast the moral of all workers (ILO, 2010). This can go a long way to reduce the negative perceptions and prejudices people have about the capabilities of Persons With Disabilities.

2.3.3 PWDs' Access to Agricultural Services

According to the International Labour Organisation (2015), there are over 1 billion people employed in agriculture the world over, representing 1 in every 3 workers.

Although about 60% of sub-Saharan Africans are engaged in agriculture, People With Disabilities are often excluded from agricultural employment opportunities (FAO, 2013). In most societies in Africa, growing space, land tenure and capital to invest in agriculture such as tools and seeds, may be limited to only persons without disabilities (Leonard Cheshire Disability, 2013, & WHO, 2011). In addition, agriculture extension and financial services such as microcredit might not be accessible to PWDs to enable them engage in agricultural production (Leonard Cheshire Disability, 2013, & Mbo'o-Tchouawou, & Colverson, 2014).

In many developing countries like Ghana, rural populations as well as the national economy is heavily reliant on agriculture (Mbo'o-Tchouawou, & Colverson, 2014, &

Dewbre & Borot de Battisti, 2008). Agriculture is a vital sector of the Ghanaian economy and it accounted for about 20% of the Gross Domestic Product in 2016 (Bagbara, 2017, & GoG, 2017).

Studies all over the world have acknowledged the important role of agricultural extension in the transformation of the agricultural sector (Worth, 2008, & Mbo'o-Tchouawou, & Colverson, 2014). Effective and timely extension delivery has the potential of improving the productivity and output of rural small-scale farmers who produce much of the world's food (Akpalu, 2013).

In Ghana for instance, it is estimated that 31% of farm holdings are less than one hectare, 55% are less than 1.6 hectares while only 18% are more than 4.0 hectares per farmer (MOFA, 2002). This clearly shows the importance of smallholder farmers in ensuring food security in Ghana.

The majority of farmers in northern Ghana are small-scale farmers who depend mainly on agriculture for their livelihoods. Agriculture provides farming households the opportunity to meet their dietary needs and also provides cash to meet their daily needs such as housing and school fees (Elifadhili, 2013).

To enable farm households meet their family food and financial demands, small-scale farmers especially those who dwell in rural areas are obliged to adhere to good agricultural practices in other to increase their productivity (Elifadhili, 2013, & Akpalu, 2013).

However, rural farmers face many challenges with regards to access to suitable knowledge, improved and innovative technologies, credit facilities and other relevant

social services (Mbo'o-Tchouawou, & Colverson, 2014). For Persons With Disabilities, the situation is far worse due to the intersection of poverty and disability.

Studies have shown that disability and poverty are highly correlated, especially multi-dimensional poverty (Groce *et al*., 2011**)**. Disabling conditions such as few or no links between disabled people's organizations, community based rehabilitation programmes, agricultural agents, NGOs and government groups that work on agricultural related activities, as well as unfavourable inheritance practices, limit the involvement of Persons With Disabilities in agriculture (New Agriculturalist, 2013; Heymann, Stein, & Moreno, 2014; Leonard Cheshire Disability, 2013; & Mitra *et al.*, 2011).

A study in Iran aimed at addressing the extension needs of disabled farmers found that almost all disabled farmers interviewed felt a need for additional skills and experience in farming operations. In addition, three-quarters of them had never attended any extension training classes or meetings. The study also urged extension agents to consider the peculiar needs of disabled farmers in other to meet their training and extension needs (Qamar & Shabazi, 2003).

As a major partner in agricultural development, extension services are tasked with the responsibility of transferring improved agricultural technology to the farmers as well as assist them to secure micro loans to enable them increase farm productivity to improve their livelihoods.

After independence, Ghana tried various extension approaches including extension under the farmers' cooperative movement (MOFA, 2002). The beginning of the 1990s saw the adoption of the Training and Visit (T&V) extension system nationwide by the Directorate of Agricultural Extension Services.

This extension initiative was supported with funding from the World Bank through the National Agricultural Extension Project (NAEP).

Over the years, efforts to improve the lives of People With Disabilities continue from government agencies and NGOs through agricultural extension but the demand for extension services far exceeds available resources (Ali-Olubandwa, Kathuri, & Wesonga, 2011). The current extension to farmer ratio is 1:3000 (MOTI, 2015). This means that one extension officer is required to take care of about 3000 farmers. This is highly disproportionate and no effective extension service can be extended to farmers under this current situation.

The fundamental contribution to food security by disabled farmers was highlighted in the world Food Summit organized by FAO in 1996. It was made known that a large proportion of the disabled people were farmers with responsibility for the food security of their households (FAO, 2006).

Some successful projects have attested to the fact that, disabled people can contribute meaningfully to agricultural productivity (FAO, 2010). In Niger for instance, CBM International works with People With Disabilities and their families to develop "survival yards", which are, gardens 25 by 25 meters square with a well and simple watering canals. This has enabled PWDs to produce food throughout the year, which is also helping to feed their communities (New Agriculturist, 2013).

In addition, a food security programme started by seven Bangladeshi organisations in partnership with three Dutch NGOs namely, ICCO, The Leprosy Mission and Dark & Light, ensured that, Persons With Disabilities were included in the Food Security programme. The local Disabled People's Organisations provided training to field staff on how to include PWDs in agricultural and income generating activities. The result

in the first year showed that, 9% of households included in the programme had a disabled family member (Bruijin, 2014, & FAO, 2010). Another notable intervention is the mushroom production in Asia, which employed a unique technical project approach towards empowerment of disabled farmers as self-employed food producers. This led to the establishment of a mushroom training school by a group of disabled farmers which was open to the public (FAO, 2010).

However, the role of disabled farmers to food security has received little recognition in the Ghanaian context. This is evident in the fact that, interventions targeting PWDs are put under the gender mainstreaming efforts by the Ministry of Food and Agriculture (MOFA, 2013). Notable interventions include the credit in kind scheme and the integration of rehabilitated mentally retarded persons and individuals from the leprosarium in West Mamprusi, Talensi and Builsa Districts (MOFA, 2013, & MOFA, 2016).

2.4 Theoretical Perspectives of Participation of Persons With Disabilities in Agriculture

Theoretical models of disability are tools that enable governments, development partners and researchers posit about the cultural, social, political and economic factors that define disability and ultimately, device strategies for meeting the needs of disabled people (Disabled World, 2010). For this study, the theoretical models of disability were reviewed based on two broad approaches; the individual approach which sees the person as having a problem; and the social approach, which sees society as having the problem of not being able to accommodate all people (Al Ju'beh, 2015). This is essential as it traces the various models of disability as they explain the economic situation of disabled people in different ways over time (Turmusani, 2003). Different models of disability inform how disability is understood

and acted upon (Rohwerder, 2015). Disabled people face barriers that are not only related to their physical appearance.

PWDs across the world face attitudinal barriers such as prejudice and stereotype which prevents them from participating in society on an equal basis with non-disabled people (Scope, 2017).

2.4.1 Charity Model

Largely driven by poignant appeals for charity, the charity model of disability focuses on the individual, and tends to view People With Disabilities as passive victims and objects of pity who need care and protection (Al Ju'beh, 2015, & CUTS International, 2011). The Charity Model sees People With Disabilities as victims of their condition and whose impairment is their main identifier (Al Ju'beh, 2015). The fundamental bedrock of this model relied on the fact that, disability was perceived as ineligibility for claiming the right of social resources. This ensured the systematic exclusion of PWDs from social arrangements, public services and further justified their exclusion from mainstream education and employment opportunities (CUTS International, 2011).

The charity model relates with the medical model in the fact that the 'problem' of disability is seen as inherent in the individual who has the impairment, thus, disability is seen as a deficit (Harris & Enfield, 2003).

It assumes that a disabled person's main need in life is to be looked after due to the disabled person's inability to walk, talk, see, learn, or work (Harris & Enfield, 2003). It is also assumed that disabled people can't think, decide, or act on their own behalf, and that someone else needs to do those things for them (Harris & Enfield, 2003). The charity model perceives People With Disabilities' situation as tragic and makes

provision for special services, special institutions or homes for them (Harris & Enfield, 2003, & Al Ju'beh, 2015).

Another key feature of the charity model is that it relies largely on the generosity of benevolent humanitarians for 'protective care' of Persons With Disabilities (CUTS International, 2011). The resultant effect is an army of powerless individuals, dependent on arrangement maintained by these so called 'benevolent individuals' who operate outside of the mainstream development and State sponsored charities (CUTS International, 2011).

The charity model has been criticized for focusing on what the individual cannot do: can't walk without crutches, can't hear without a hearing aid, and can't use his or her arms to name a few (Harris & Enfield, 2003). On the contrary however, the focus should be placed on providing an enabling environment that would encourage Persons With Disabilities to be productive members of their societies. Persons With Disabilities should be encouraged to earn their own living and take active part in decision making in their societies.

2.4.2 Medical Model

The Medical model considers People With Disabilities as persons who have physical problems that are directly caused by a disease, an injury, or some other health condition and requires medical care in the form of treatment and rehabilitation (Mitra, 2006, & Harris & Enfield, 2003). In this model, a Person With Disability is fundamentally defined as a patient, in relation to their diagnosis which requires medical intervention (Al Ju'beh, 2015).

According to the Medical Model, Persons With Disabilities need special services, such as special transport systems and welfare services (Harris & Enfield, 2003). This

pushes PWDs into the passive role of patients. It assumes that addressing the medical ailment will solve the 'problem' – that disability needs to be fixed or cured (Al Ju'beh, 2015).

The disabled person and his or her life become defined exclusively in terms of the diagnosis. Someone with a diagnosis is regarded as a patient: no longer a person, just a case for clinical treatment (Harris and Enfield, 2003).

For this purpose, special institutions exist, for instance hospitals, special schools or sheltered employment places where professionals such as social workers, medical professionals, therapists, special education teachers decide about and provide special treatment, education and occupations for Persons With Disabilities (Harris & Enfield, 2003).

The medical model aims at making People With Disabilities "normal" by addressing the medical ailment, disease or defect that Persons With Disabilities suffer (Al Ju'beh, 2015). This could be interpreted by implication that PWDs are in some way abnormal. The issue of disability is limited to the individual in question: in case of disability, the disabled person has to be changed, not society or the surrounding environment.

Medical and charity models of disability have resulted in the development and implementation of interventions based largely on impairment needs assessed by so called "expert personnel" that are often severely limited in geographical, age, and impairment reach, as well as generally being expensive to run (Coe, 2012).

This model has been widely criticized on several grounds, including the fact that, it fails to consider the important roles of environmental and social barriers (Mitra, 2006, & Rimmerman, 2013). In addition, this model promotes the view of a disabled person

being helpless and needing to be cured or cared for, and it further justifies the way in which disabled people have been systematically excluded from society (CUTS International, 2011). The medical model is also known as the 'individual model' because it encourages the impression that it is the individual disabled person who must adapt to the way in which society is constructed and organized (CUTS International, 2011).

2.4.3 Social Model

The last three decades has seen the emergence of disability scholars who have tried to systematically formulate theories that explain disability in academic circles. These scholars mainly belong to the disabled peoples organizations whose aim is to discount current analysis of disability based on the medical and mainstream social contexts (Terzi, 2004).

This led to the conceptualization of the social model of disability which was developed as a reaction against the individualistic approaches of the charitable and medical models (Al Ju'beh, 2015, & Rimmerman, 2013). Disability activists in the Union of the Physically Impaired Against Segregation (UPIAS), a disability movement in Britain, developed the social model of disability in the 1970s. The social model gained grounds in academia through the works of Vic Finkelstein (1980, 1981), Colin Barnes (1991) and Mike Oliver (1990, 1996) (Shakespeare & Watson, 2002).

Although disabled persons may suffer from physical, mental or sensory impairment, the social model of disability places much emphasis on the role society plays in the problems Persons With Disabilities encounter instead of making disability an attribute of the individual (Altman, 2001; Barnes, 1992; Finkelstein, 1980; Linton, 1998; Oliver, 1990; Union of the Physically Impaired Against Segregation [UPIAS], 1976,

cited in Naami, 2010). The social model is the term used by disabled people's organisations that have come to the realization that the medical and charity models severely and needlessly restrict the roles that disabled people can play in society (Harris & Enfield, 2003). Treating disabled people according to the medical or charity models makes them dependent on certain "non-disabled" people and separates them from the rest of society. For many Disabled Peoples Organisations, the social model describes the true nature of the problem of disability: the problem is neither the individual nor his or her impairment (Harris & Enfield, 2003).

The social model is human rights driven and socially constructed (Woodburn, 2013). It sees disability as created by the social environment, which excludes people with impairments from full participation in society as a result of attitudinal, environmental and institutional barriers (Mitra, 2006).

It places emphasis on society adapting to include People With Disabilities by changing attitudes, practice and policies to remove barriers to participation (DFID, 2000, & Al Ju'beh, 2015).

A fundamental aspect of the social model concerns equality and strongly believes in the phrase "Nothing about us without us" (CUTS International, 2011). The social model of disability is based on a differentiation between the terms "impairment" and "disability." Impairment refers to the actual attribute or anomaly, of a person, whether in terms of limbs, organs or mechanisms, including psychological. It addresses issues such as the under-estimation of the potential of disabled people to contribute to the society by enhancing their livelihoods (CUTS International, 2011). The social model has been criticized for ignoring the personal impact of disability and for its emphasis

on individual empowerment, which may be contrary to more collective social customs and practices in many developing countries (Al Ju'beh, 2015, & Rimmerman, 2013).

2.4.4 Human Rights Model

This model of disability is based on the social model and also seeks to transform unjust systems and practices by stating the fact that it is society that needs to change (Al Ju'beh, 2015). The human rights model is closely related to the social model of disability in that; it focuses on the fulfilment of human rights and also looks to include all people equally within society: women and men, girls and boys regardless of background or any type of characteristic (Harris & Enfield, 2003, & Al Ju'beh, 2015). This model situates disability as an important aspect of human culture, and it confirms the fact that all human beings irrespective of their disabilities have certain rights which are inalienable (CUTS International, 2011, & Al Ju'beh, 2015).

The human rights model builds upon the essence of the Universal Declaration of Human Rights, 1948, which states that, all human beings are born free and equal in rights and dignity (CUTS International, 2011).

Over the years, the social and human rights models have formed the basis of many disability policies and practices (Kett & Twigg, 2007). This model takes the CRPD as its main reference point and sees People With Disabilities as the central actors in their own lives as decision makers, citizens and rights holders (Al Ju'beh, 2015, & CUTS International, 2011). Consequently, society has to change to ensure that all people including People With Disabilities have equal possibilities for participation in society on an equal basis with others, thus promoting the principle of diversity (Harris & Enfield, 2003 & CUTS International, 2011). According to Barron and Amerana (2007), the model evolved out of the need to guarantee the human rights of disabled

people by focusing on critical issues that determine social inclusion such as access to education, employment, accessible transportation, housing and access to public places.

In reality however, the treatment of difference has been poor especially in the context of disability due to the fact that Persons With Disabilities may require specialised support services to be materially equal to others. Thus, laws, policies and interventions need to be tailored to ensure that barriers created by society are removed (Al Ju'beh, 2015, & CUTS International, 2011).

The Rights-based Models affirm the fact that the provision of support to PWDs is not a question of humanity or charity, but instead a basic human right that any person can claim (Al Ju'beh, 2015). The central themes of the rights-based approach are empowerment and accountability. Accountability relates to the duty of public institutions and structures to implement the rights of PWDs and also to justify the quality and quantity of their implementation while empowerment refers to the participation of People With Disabilities as active stakeholders in society (Al Ju'beh, 2015).

2.5 Conceptual Framework

Disabled farmers operate within certain limitations such as type of disability, gender, household status among others, as well as the general stress and shocks in agricultural production such as climate variability, market failures, and price fluctuations. For PWDs to be actively engaged in agriculture, they will definitely need certain assets or agricultural inputs. An individual's ability to access these inputs or assets will determine whether he or she can actively engage in agriculture or otherwise. An individual's ability to access land which is identified as a natural capital in the DFID

sustainable livelihood framework, microcredit (DFID financial capital), machinery, tools and equipment (DFID physical capital), labour (DFID human capital) and the ability to leverage on relationships and networks to be able to carry out agricultural activities (DFID social capital), will interact to determine an individual's ability to productively or actively engage in agriculture (DFID, 2000). The Food Security Cycle of PWDs looks at how the institutional structures either facilitate or impede PWDs ability to productively utilize agricultural resources to engage in meaningful agricultural production (DFID, 2000).

These transforming structures and processes will be effectively utilized if the disabled farmer effectively participates in agriculture by having control over agricultural production and decision making. The transforming structures and processes take into consideration the larger agricultural policy and implementation frameworks of the country. The transforming structures seek to find answers to questions such as:

How is the nation's agricultural framework and how is it amendable to the circumstance of PWDs?

How is relationship and authority relating to input in agriculture organized in the country?

Who has ownership rights and control over land?

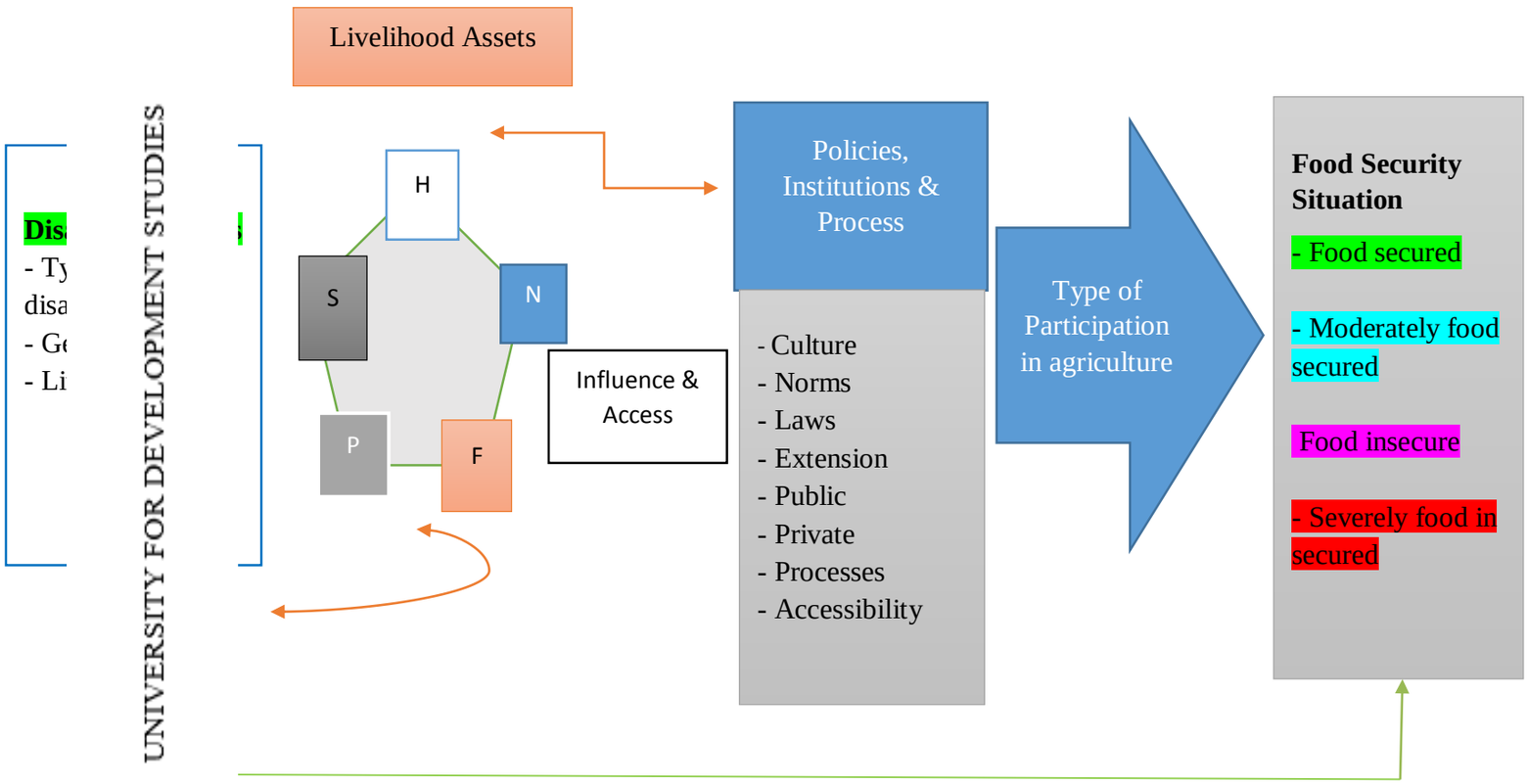
How does the agricultural inputs market operate in Ghana and how does it affect PWDs?

The transforming structures could also include the socio-cultural issues as it relates to disability. Thus, all these issues will transform the ability of PWDs to engage in agriculture. The process through which PWDs move through these institutional

transforming structures to be able to engage effectively in agriculture is modelled in the framework as 'process' (DFID, 2000).

This looks at how the institutional structures either facilitate or impede PWDs ability to productively utilize agricultural resources to engage in meaningful agricultural production.

These transforming structures and processes will be effectively utilized if the disabled farmer effectively participates in agriculture by having control over agricultural production and decision making.



H- H N- Natural Capital, S- Social Capital, F- Financial Capital, P- Physical Capital

Figu ecurity Cycle of PWDs

Sourc)

CHAPTER THREE: METHODOLOGY

3.1 Introduction

The methodology section describes the rationale for the application of specific procedures and techniques used to identify, select and analyse information applied to understanding the research problem (Kallet, 2004). Somekh and Lewin (2005) explain research methodology as both the collection of methods or rules by which a particular piece of research is undertaken and the principles, theories and values that underpin a particular approach to research.

This section of the thesis discusses the design of the research, population and sample of the study, sampling technique, data type and collection instruments and the suitable method of analysing the data.

3.2 Study Design

According to Burns and Grove (2009), the design is the blueprint for conducting a study with maximum control over factors that may interfere with the validity of the findings. In addition, Polit, Hungler, and Beck (2001) explain research design as the researcher's complete guide for answering the research questions or testing the research hypothesis.

Descriptive survey design was employed in carrying out this study with mixed method (both qualitative and quantitative) methods of data collection adopted in gathering data for the study.

According to Burns and Grove (2009), descriptive research is designed to provide a picture of a situation as it naturally happens. Descriptive research involves gathering

data that describe events and then organizes, tabulates, depicts, and describes the data collection (Hyde, 2000).

Due to the fact that, the human mind cannot extract the full import of a large mass of raw data, descriptive statistics are very important in reducing the data to a manageable form (Myers, 2009).

In addition, Johnson and Onwuegbuzie (2004) explain mixed methods research as the class of research where the researcher combines quantitative and qualitative research techniques and methods into a single study. The real strength of mixed method as stated by Venkatesh, Brown, and Bala (2013) is the possibility of developing meta-inferences based on a combination of qualitative and quantitative data and analysis. This develops an understanding of a phenomenon for which either approach in isolation would be insufficient.

3.3 Study Area

The study was conducted in the Savelugu-Nanton Municipality of the northern region of Ghana. The Municipality, with its administrative capital in Savelugu, is located at the northern part of the Northern Region of Ghana.

This section examines the geographical features in the Municipality which define the present situation of the study area. It further uncovers the socio-economic and institutional arrangements as situated in the Municipality to help appreciate the potentials and constraints to agriculture in that geographical setting chosen for the study.

The main source of information presented in this section was secondary material from the Savelugu-Nanton Municipal Assembly. Figure 3.1 shows the map of the Savelugu-Nanton Municipality.

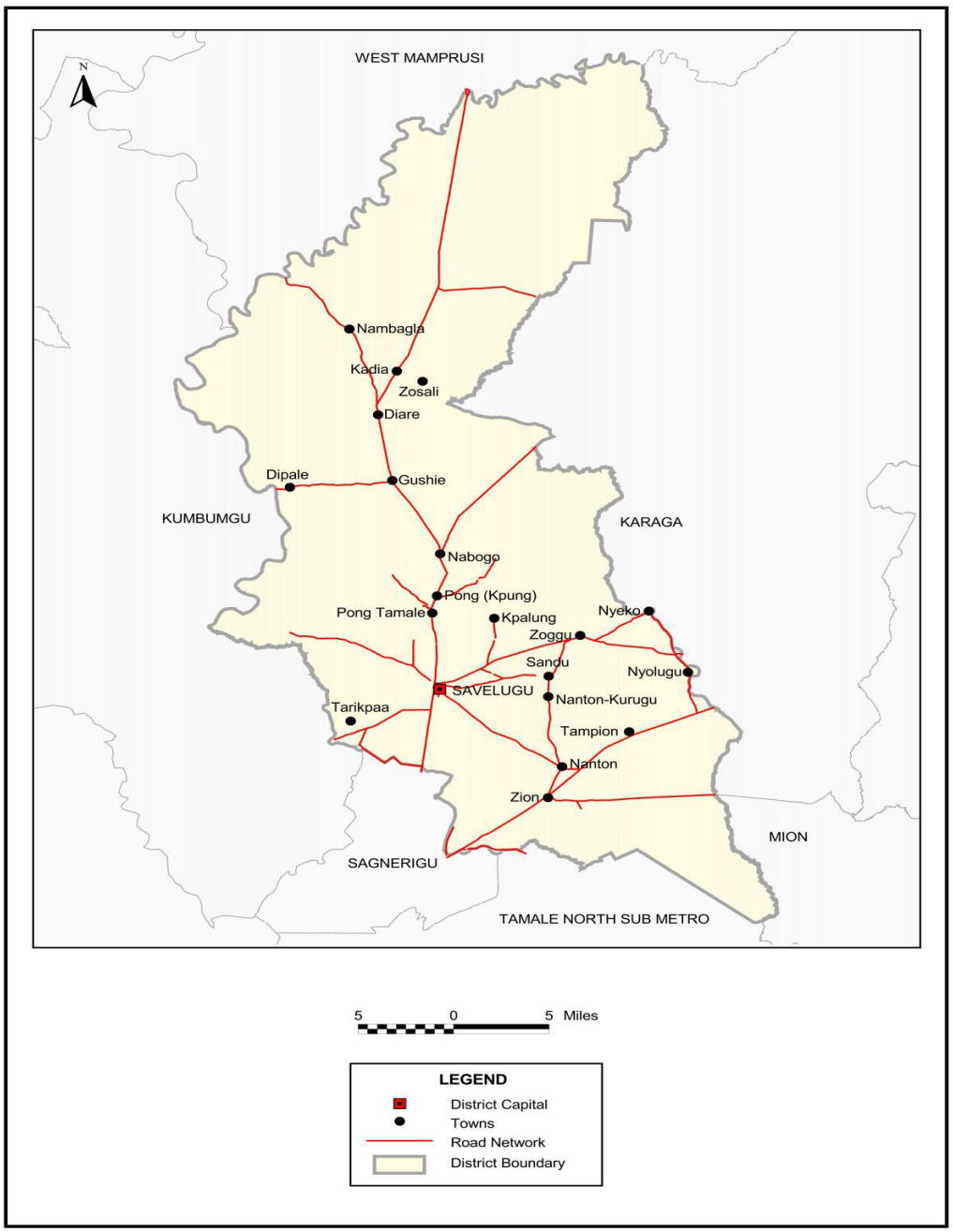


Figure 3.1 Map of Savelugu-Nanton

Source: GSS, 2014

3.3.1 Profile of the Savelugu-Nanton Municipality

The Savelugu-Nanton Municipality, with its administrative capital in Savelugu, is located at the northern part of the Northern Region of Ghana. It shares boundaries with West Mamprusi District to the North, Karaga District to the East, Kumbungu District to the West and Sagnerigu District to the South. The Municipality has about 149 communities with a population of 139,283 representing 5.1% of the region's total population. Males constitute 48.5% and females represent 51.5%. In addition, 60% of the population is rural (GSS, 2014). The Municipality has a total land area of about 2022.6 sq. km. with a population density of 68.9 persons per sq. km (GSS, 2014). In addition, the Municipality lies between longitude -8278° and latitude 9.6247° (Zwiefelhofer, 2018).

The Association of Persons With Disabilities in the Municipality has a well-documented database of PWDs throughout the Municipality and this made the Savelugu/Nanton Municipality an ideal place to conduct this research on PWDs. The Association of Persons With Disabilities in the Municipality conducted an extensive census from November, 2015 to February, 2016 and obtained a population of 779 PWDs across the six administrative zones in the Municipality and this was used for the study. The Savelugu/Nanton District was carved out of the Western Dagomba District Council under the PNDC Law 207 in 1988. This Law was replaced by the Legislative Instrument (LI) 1450 under the Local Government Act 1993 (Act 462). In March 2012, the Assembly was up-graded to a Municipal status under the Legislative Instrument (LI) 2071 (GSS, 2014).

The Municipality is generally flat with gentle undulating low relief. The altitude ranges between 400 to 800 ft. above sea level with the southern part being slightly hilly and sloping gently towards the North.

The area receives an annual rainfall averaging 600mm, which is considered enough for a single farming season. The annual rainfall pattern is erratic at the beginning of the raining season, starting in April, intensifying as the season advances raising the average from 600mm to 1000mm (SNMA, 2015).

Temperatures are usually high, averaging 34^{o}C. The maximum temperature could rise as high as 42^{o}C and the minimum as low as 16^{o}C. The low temperatures are experienced from December to late February, during which the North-East Trade winds (harmattan) greatly influence the Municipality. The generally high temperatures as well as the low humidity brought about by the dry harmattan winds favour high rates of evaporation and transpiration, leading to water shortages (GSS, 2014, & SNMA, 2015).

According to SNMA (2015) there are 630 Persons With Disabilities in the Municipality, out of which 422 are physically challenged (217 males and 205 females), 208 are blind (114 females and 94 males) and 3 are Albinos. However, the figure obtained by the Association of Persons With Disabilities in the Municipality (779) was used for the study.

Women in the Municipality have access to land but have limited control over the land. Men cultivate their crops on fertile lands and the less fertile lands are given to women. It must be stated that most of the crops grown by women are vegetables mostly used as soup ingredients, which are not grown in large quantities. Men have access to tractor services because they own them and also have access to farm inputs and labour than women and this often results in women farming in small lands with little yields.

The main drainage system in the Municipality is made up of White Volta and its tributaries. The effect of the drainage system is felt mostly in the northern part of the Municipality covering the areas between Nabogu and Kukuobilla. These areas are

prone to periodic flooding during the wet season, thus making them suitable for rice cultivation (SNMA, 2015).

One of the tributaries of the White Volta, 'Kuldalnali', stretches to constitute a natural boundary between the Municipality and Kumbungu District.

The Municipality finds itself in the interior (Guinea) Savanna woodland which could sustain large scale livestock farming, as well as the cultivation of staples like rice, groundnuts, yams, cassava, maize, cowpea and sorghum. The trees found in the area are drought resistant and hardly shed their leaves completely during the long dry season. Most of these are of economic value and serve as important means of livelihood especially for women. Notable among these are shea trees, the nuts which are used for making shea butter and dawadawa that provides seeds used for condimental purposes. The sparsely populated north has denser vegetation mostly with secondary forest. The populous south on the other hand, is depleted by human activities such as farming, bush burning and tree felling among others (SNMA, 2015).

The greatest threat to the Municipality is the rate at which the tree vegetation is being cut down for fuel wood. Farming along river courses has also caused vast silting of the few drainage systems which therefore dry up quickly in the dry season and flood easily in the wet season. Recent gravel winning on good farmlands alongside the major trunk road and sand winning for which a greater percentage is used for construction work in Tamale without efforts at reclamation is an issue of concern (GSS, 2014, & SNMA, 2015).

The population density in 2010 was 78 persons per sq. km and in 2013 it became 85 persons per sq. km.

The working age group (19-60 years) accounts for 45% of the population and the dependency age group accounts for 55% of the population. The aged is about 3% of

the population of the Municipality, whiles the school age group account for 52% of the population. 94,702, representing 60.3% of the population of the Municipality live in Rural Areas. In addition, there are more male household heads (10.6%) as compared to females (2.2%) and also there are more male children (51.1%) than female children (35.8%). This shows a greater percentage difference of male dominance with the females playing a supportive role in the household.

The average household size remains 8.7 with the smallest household comprising one member and the largest household having 47 members.

Also, there are 149 communities in the Municipality. The communities are administratively demarcated into six Zonal Councils, namely, Savelugu, Nanton, Diare, Pong-Tamale, Moglaa and Tampion. The 143 other communities could be described as rural. About 60.3% of the populace resides in these rural communities and 39.7% in the few urban towns.

3.4 Study Population

A population is a group of individuals, persons, objects, or items from which samples are taken for measurement (Saunders, Lewis, & Thornhill, 2009). Target population is the entire group of individuals about whom one wants to gather information. The target population of the study was all disabled farmers in the Municipality. Information about PWDs was also obtained from stakeholders including staff of the Municipal Assembly and executives of the Association of Persons With Disabilities.

From these sources, the total population of PWDs in the Municipality was found to be seven hundred and seventy nine (779) with two hundred and sixty three (263) found to be engaging in agriculture for their livelihood.

3.5 Sample Size Determination

The total number of PWDs obtained from the Association of Persons With Disability was 779.

Persons with disability engaged in agriculture were 263, with 79 of them being female and the remaining 184 being male.

Using the Krejcie and Morgan (1970) formula,

$$S = \frac{X^2NP\ (1-P)}{d^2\ (N-1) + X^2P\ (1-P)}$$

Where:

s = Required Sample Size

X = Z value (1. 96 for 95% confidence level)

N = Population Size

P = Population Proportion (0.5)

d = Degree of accuracy (0.5)

To calculate the sample size for Persons With Disabilities engaged in agriculture

$$S = \frac{X^2NP\ (1-P)}{d^2\ (N-1) + X^2P\ (1-P)} = \frac{(1.96)^2 263 * 0.5\ (1-0.5)}{0.05^2(263-1) + (1.96)^2 * 0.5\ (1-0.5)}$$

= 156.36 rounded off to

156 PWDs engaged in agriculture.

3.6 Sampling Techniques

A sample is a sub-group of the population which is an ideal representative of the entire population (Kumar, 2008). The sampling techniques used in the study were, stratified random sampling and simple random sampling.

A multi-stage sampling procedure was used to obtain the sample size.

Step i The list of PWDs was obtained from the Association of Persons With Disabilities in the Savelugu-Nanton Municipality. There were 779 PWDs in the Municipality of which 263 engage in agriculture and this constituted the population and the sampling frame for the study.

Step ii Cluster sampling technique was used to cluster PWDs according to the type of disability. Here two broad types of disability were considered namely physical disability and sensory disability. Physically disabled farmers were 144 whereas sensory disabled farmers were 119. This was done because; each one of them represents a certain kind of inherent limitation peculiar to that category. People who are physically impaired may have certain inherent limitations that will be peculiar to them and this will vary from people who have sensory impairments.

Step iii For each of the categories, further clustering was done according to sex as male and female. The females were 79 whiles males were 184. This was done to ensure that the final sample will reflect both the disability distribution and the gender distribution to ensure a fair and balanced study.

Step iv Proportional representation to size was used to select respondents from each stratum to get the sample size, with simple random sampling technique employed in drawing respondents from each stratum.

Table 3.1 Sampling Proportions

Category	Number Sampled
Female Disabled Farmers	79
Male Disabled Farmers	184
Final Sample obtained	156

Source: Author (2017)

3.7 Data Collection

The study made use of both primary and secondary data. Primary data was collected from PWDs engaged in agriculture as well as the stakeholders in agriculture.

This was done using personal interviews guided by semi-structured questionnaires, observation, key informants interview and focus group discussions. In addition, friends and family members of sensory disabled persons were used to communicate with sensory disabled farmers. Also, secondary data was collected from records of Municipal Department of Agriculture, Association of Persons With Disabilities and the Municipal Assembly.

3.8 Data Analysis

Both descriptive and inferential statistics were employed in analysing the data gathered in this study. The various analytical techniques applied in achieving each objective is explained here.

For objective one, which sought to examine the nature and extent of participation of PWDs in agriculture in the Municipality, descriptive statistics was employed to summarize the data with frequency distribution used to present the results.

For objectives two and three, which sought to examine the extent to which agricultural services providers incorporate the concerns of PWDs in their service delivery and its influence on PWDs access to these services, both quantitative and qualitative data was gathered for it. Descriptive statistics was employed to analyse the quantitative data and the results presented in frequency distribution. The qualitative data was summarised and the main and sub themes and relationships were highlighted and interpreted.

With objective four, which sought to determine how PWDs participate in agriculture, Random Utility Theory (RUT) was adopted as a theoretical model in settling on the empirical model used in the assessment.

The RUT follows the utility-maximization condition which assumes that rational people will select a product only if the product provides him or her highest utility given a constraint (McFadden, 1974). Here, PWDs forms of participation in agriculture, either merely through labour contribution or actively taking part in production decision and use of produce, is modelled based on their individual rational decision subject to social and physical constraints. Since RUT provides a theoretical framework for modelling individual decisions based on rational choice subject to certain constraints, it was considered appropriate in modelling PWDs participation in agriculture. Also, DFID (2000) sustainable livelihood framework was adapted in identifying variables defining the sociocultural and institutional transforming

structures filtering PWDs access to productive assets needed to engage in meaningful agricultural production.

In settling on the empirical model, 'Probit Regression Model' was applied because the dependent variable is a binary response variable (Rencher, 2002, & Gujarati, 2004). Either a respondent participates in agriculture merely by labour contribution (supplying labour to carryout household agricultural activities which the he/she has no control over decision on what to produce, how to produce it, when to sell and how the income is used) or a respondent participates in agriculture by having control or participating in production and marketing decisions.

Another important discrete model is the Logic Regression Model which produces similar results as the Probit model (Gujarati, 2004). The decision to settle on probit model for the analysis is based on its realistic standard normal distribution of errors (Rencher, 2002, & Gujarati, 2004). The Probit model assumes that there is a latent continuous variable that determines the value of the equation:

$$y^* = \beta_0 + \sum_{i=1}^{n} x\beta + u_i \quad \text{.....(1)}$$

Where y* is the latent continuous variable, X_i is a set of explanatory variables assumed to influence PWDs participation in agriculture, β_i is a vector of unknown parameter to be estimated and u_i is the statistical noise assumed to be normally and independently distributed with a zero mean and a constant variance. The method of estimation of the Probit model was by maximum likelihood and interpretation of Probit results was based on marginal effects treated as probabilities, which explained

the slope of the probability curve relating one explanatory variable to prob (y=1|x), holding all other variables constant.

The observable dependent variable is defined by:

$$y = \begin{Bmatrix} 1 \text{ access if } y^* > 0 \\ 0 \text{ no access if } y^* \le 0 \end{Bmatrix} \quad \text{.....(2)}$$

The probit model Y follows the Bernoulli distribution with probability

$$\pi_i = prob(y=1) = \Phi(X\beta) \quad \text{.....(3)}$$

Where π_i is the probability that a student intends to take up career in farming, X_i' is the explanatory variables, β is the regression parameters to be estimated.

In the Probit model, functional distribution of the error is very important to constrain the values of the latent variable into desirable property of probability values of 0 and 1. The Probit model assumes a cumulative distribution function of standard normal distribution represented by Φ .

$$\begin{aligned} &prob(y=1) = prob(y_i^* > 0) = prob(\beta X + e > 0) \\ &= prob(e > -\beta X) \\ &= prob(e < \beta X) \\ &= \Phi(\beta X) \end{aligned} \quad \text{..... (4)}$$

In the case of normal distribution function, the model to estimate the probability of observing a student choosing to go into a career in farming can be stated as:

$$\Pr ob(y_i = 1/X) = \Phi(\beta X) = \int_{-\infty}^{\beta X} \frac{1}{\sqrt{2\Pi}} \exp\left[\frac{-z^2}{2}\right] \partial z \quad \text{..... (5)}$$

Where:

y_i *is a Probability* of observing a student choosing to go into a career in farming, X is a vector of the explanatory Variables, Z is the Standard Normal Variable (Z ~N (0, δ^2) and β is a k by 1 vector of the Coefficients estimated.

Therefore, the Empirical Probit model is specified in the following form:

$$Y = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + \beta_6 X_{6i} + \beta_7 X_{7i} + \beta_8 X_{8i} + \beta_9 X_{9i} + \beta_{10} X_{10i} + U_i \quad [6]$$

3.9 Measuring PWDs' Participation in Agriculture

PWDs participation in agriculture was measured using a three (3) point Likert Scale as: 1 = 'somewhat engaged in agriculture activities' (engage in agriculture activities but are not involved in the decision on production and marketing activities) and 2 = 'actively engaged in agriculture activities (engage in making decision on production and marketing of agriculture) 3 = 'very actively engaged in agricultural activities' (fully engage in both agricultural activities and decision on agricultural production and marketing). Only respondents scoring one (1) on the Likert scale were classified as 'not actively participating in agriculture', while those scoring above one (1) were classified as 'actively participating in agriculture. Therefore, the dependent variable 'participation in agriculture' is a binary or dichotomy variable. And as such, binary response model was considered in modelling the multiple regression equation explaining the determinants of participation of PWDs in agriculture. The most widely used binary response regression model is probit and logistic regression models.

Table 3.2 Description of Variables used in the Probit Regression Model

Variable	Description	Measurement	Hypothesized sign
X_1	Age of respondent	Years	+
X_2	Sex of respondent	Dummied 1 = male; 0 = female	+/-
X_3	Education	Years in school	+
X_4	Employment status	Dummied as 1 = self-employed; 0 = otherwise	+
X_5	Type of disability	Dummied as 1 = physical; 0 = sensory	+
X_6	Experience in main occupation	Years	+
X_7	Credit access	Dummied as; 1 = yes; 0 = no	+
X_8	Access to extension	Number of extension visit	+
X_9	Family size	Number of people	-
X_{10}	Access to labour	Dummied as; 1 = yes; 0 = no	+
X_{11}	Role in HH decision	Dummied as; 1 = active; 0 = otherwise	+
X_{12}	Role in comm. decision	Dummied as; 1 = active; 0 = otherwise	+
X_{13}	Marital status	Dummied as; 1 = married; 0 = otherwise	+

Source: Author, 2016

In addition, the effects of PWDs participation in agriculture on their food security situation was analysed using Analysis Of Variance (ANOVA) and the Household Food Insecurity and Access Scale (HFIAS). The Household Food Insecurity and Access Scale (HFIAS) is a method based on the idea that the experience of food insecurity (access) causes predictable reactions and responses that can be captured and quantified through a survey and summarized in a scale (Coates, Swindale, & Bilinsky, 2007). The HFIAS is made up of 18 questions, comprising of 9 'occurrence' questions and 9 'frequency of occurrence' questions. These questions represent worldwide spheres of the household food insecurity (access) experience and can be used to assign households and populations along a continuum of severity, ranging

from food secure to severely food insecure (Coates *et al.*, 2007). Each of the questions is asked with a recall period of four weeks. The respondent is first asked whether the condition in the question happened at all in the past four weeks, to be replied with a yes or no. If the respondent answers "yes" to an occurrence question, a frequency-of-occurrence question is asked to determine whether the condition happened rarely (once or twice), sometimes (three to ten times) or often (more than ten times) in the past four weeks (Coates *et al.*, 2007).

For constraints to PWDs participation in agriculture, Kendall's coefficient of concordance was applied to analyse the constraints. Kendall's Coefficient of Concordance, (*W*) proposed by Maurice G. Kendall and Bernard Babington Smith is used to determine the degree of agreement among ranked scores (Kendall and Smith, 1939).

W is a measure of the agreement among judges assessing a set of subjects in ranked order (Legendre, 2010). It is used to assess the degree to which respondents in a study provide common ranking on an issue with the same general property.

The limits for *W* must fall between zero (0) and one (1). If it is one (1) then the ranks assigned by each respondent are assumed to be the same as those assigned by other respondent and zero (0) when there is maximum disagreement among the rankings by the respondents. From the preference ranking, the total rank score for each item is computed and *W* calculated. The *W* is calculated using the formulae;

$$W = {12(S)} \Big/ {m^2(n)(n^2-1) - mT} \quad \text{..... (7)}$$

Where ***n*** is the number of objects, ***m*** is the number of variables and ***T*** is a correction factor, ***S*** is a sum-of-squares statistic over the row sums of ranks R_i, and R is the mean

of the R_i values computed first from the row-marginal sums of ranks R_i received by the objects:

$$S = \sum_{i=1}^{n} (R_i - \bar{R})^2 \quad \text{.......... (8)}$$

For tied ranks ***T*** is;

$$T = \sum_{k=1}^{g} t_k^3 - t_k \quad \text{.......... (9)}$$

t_k = the number of tied ranks in each (k) of g groups of ties. The sum is computed over all groups of ties found in all m variables of the data table. T= 0 when there are no tied values and the equation becomes;

$$W = {12(S)} \Big/ {m^2 (n)(n^2 - 1)} \quad \text{.......... (10)}$$

W is an estimate of variance of the row sums of ranks Ri divided by the maximum possible value the variance can take; this occurs when all variables are in total agreement. Hence $0 \leq W \leq 1$

W of 1 represents perfect concordance/agreement and 0 indicates perfect disagreement in the ranking.

The Friedman's chi-square statistic (χ^2) will be used to test the significance of the *W* obtained. From Friedman's chi-square statistic (χ^2) is given by;

$$\chi^2 = m(n-1)W \quad \text{.......... (11)}$$

This quantity is asymptotically distributed like chi-square with *(n-1)* degrees of freedom; it can be used to test *W* for significance. This approach is satisfactory only for moderately large values of m and n (Kendall and Smith, 1939 & Legendre, 2010) as in this study where n=263 and m=14.

CHAPTER FOUR: RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents and discusses the results of the study. The following major areas were presented: (a) demographic characteristics of respondents, (b) nature and participation of PWDs in agriculture, (c) the extent to which agricultural services providers incorporate the concerns of PWDs in their service delivery and its influence on PWDs access to these services, (d) the factors determining the participation of PWDs in agriculture in the Municipality, (e) the effects of PWDs' participation in agriculture on their food security situation, (f) the constraints to PWDs participation in agriculture in the Municipality.

The first section of the chapter reports on the demographic characteristics of the respondents. The next section describes the nature and participation of PWDs in agriculture. The third examines the extent to which agricultural services providers incorporate the concerns of PWDs in their service delivery and its influence on PWDs access to these services. The fourth reports on the factors determining the participation of PWDs in agriculture in the Municipality. The fifth section reviews effects of PWDs' participation in agriculture on their food security situation. The final section of the chapter reports the constraints to PWDs participation in agriculture in the Municipality.

4.1.1 Demographic Characteristics

The results of the study showed that, there are more men than women PWDs involved in agriculture in the Municipality. As shown in table 4.1, 67.3% of the respondents were male whereas 32.7% of the respondents were female. This gender disparity seems to affirm the issues raised by the Disabled Women's Network (2007), that women with disabilities from Ghana, face multiple vulnerabilities, given the

intersection of disability, gender, poverty, cultural beliefs and practices, negative perceptions about their capabilities, and geographic area.

The age distributions of the 156 PWDs surveyed (Table 4.1) indicate that majority of disabled farmers were in their active age bracket. This implies that, they can contribute meaningfully to agricultural production and help improve food security in the Municipality and the nation at large.

In addition, a large proportion of disabled farmers surveyed had no formal education (73.1%) with only 2 PWDs attaining tertiary education (Table 4.1). This corroborates the findings of a study using international comparable data from fifteen developing countries which found that, in most countries, disability is significantly associated with higher multidimensional poverty as well as lower educational attainment, lower employment rates, and higher medical expenditures (Mitra *et al.*, 2013).

The distribution of marital status suggests that there are more married PWDs in the Municipality than single. This seems to prove the strong family ties that exist especially in the rural areas where majority of PWDs reside.

Another interesting observation from the study is that majority of the respondents were Muslims. This indicates that PWDs in the Savelugu/Nanton Municipality are homogenous in terms of religion and therefore more likely to share similar beliefs and practices. This reflects the dominance of Islam as a religion in the Savelugu-Nanton Municipality hence; PWDs are well integrated into the larger community.

Table 4.1 Socio-Demographic Characteristics of Respondents

Demographic Characteristics		Frequency	(%)
SEX	Male	105	67.3
	Female	51	32.7
	Total	**156**	**100.0**
Age	< 25 years	20	12.8
	25-35 years	34	21.8
	36-45 years	29	18.6
	46-60 years	35	22.4
	>60 years	38	24.4
	Total	**156**	**100.0**
Level of Education	No formal education	114	73.1
	Basic level	31	19.9
	Secondary level	9	5.8
	Tertiary level	**2**	**1.3**
	Total	**156**	**100.0**
Marital Status	Married	96	61.5
	Single	33	21.2
	Divorced	4	2.6
	Widowed	18	11.5
	Total	**156**	**100.0**

Source: Analysis of Field Survey Data, 2017

4.1.2 Types of Disability in the Savelugu-Nanton Municipality

The results of figure 4.1 show that physical and sensory types of disability are the most dominant categories of disability in the Municipality. Physically disabled persons constitute about 48.1% of the disabled population and sensory disabled constitute about 44.9%. The least category is those who suffer from both physical and sensory disability who constitute about 7.1% of the population. This finding seems to differ from the findings of Mensah *et al.* (2008), where the visually impaired were said to be the highest category of disabled in Ghana with 59% for females and 55.1% for males. This is followed by physically disabled who constitute the second largest

category. The blind/visually impaired were the third largest category. This disparity could be attributed to the fact that, the results of the research by Mensah *et al.* (2008) was categorized under blind/visually impaired, physically impaired and deaf/hearing impaired. The focus of that study was on the type of impairment while the focus of this study is on the categories of disability.

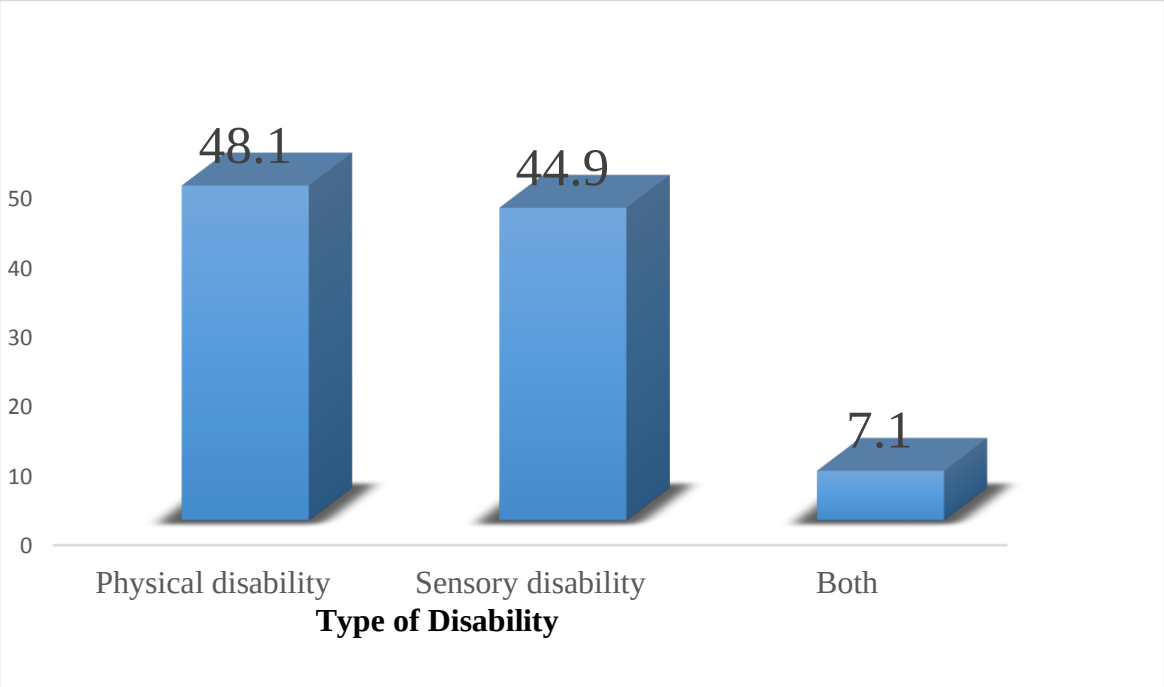


Figure 4.1 Types of Disability (%)

Source: Analysis of Field Survey Data, 2017

4.2 The Nature and Extent of Participation of PWDs in Agriculture

Living with disabilities in many parts of the world where majority of the people rely on agriculture for a living can have a profound impact on both income levels and nutritional status (New Agriculturist, 2013).

This section therefore sought to explore the various agricultural activities in the Municipality. This information is essential because, studies have shown that, PWDs

are actively engaged in agricultural activities such as gardening, growing fruit trees and livestock keeping in countries throughout Asia, the Pacific, Africa and the Americas (New Agriculturist, 2013).

In addition, this section presents the results obtained from the farmers with regards to their participation in agriculture in relation to their decision-making power on what to produce, how to produce and market it as well as how to utilize the income. Semi-structured interviews were used to interview the farmers and the results presented in tables and graphs.

4.2.1 Types of Agricultural activities PWDs engage in

Results of analysis of agricultural enterprises engaged in by PWDs surveyed as shown in Table 4.2, reveals that all disabled farmers undertake food crop production. This is done to ensure that their households have enough food to eat. The role of PWDs to food security cannot be underestimated as recognised by the FAO (2006).

Also, about 51.3% of disabled farmers in the Municipality undertake livestock rearing. This is done to supplement the income from the cultivation of crops. Majority of the respondents explained that they sell their livestock to buy grains as a means of mitigating food shortage in their households. Also, only 14.1% of the respondents undertake cash crop cultivation.

This could be attributed to the fact that PWDs are deprived in terms of access to productive resources. This situation seems to agree with the assertions by the World Health Organisation and Leonard Cheshire Disability that, in most societies in Africa, growing space, land tenure and capital to invest in agriculture such as tools and seeds, may be limited to only persons without disabilities (Leonard Cheshire Disability, 2013, & WHO, 2011).

Again, the results show that few (4.4%) PWDs undertake agro-processing and agro-marketing activities. The obvious lack of assistance for PWDs is evident in the fact that, PWDs lack the resources and necessary equipment required to undertake agro-processing activities.

The results shown in Table 4.2 is consistent with studies that have been conducted in countries throughout Asia, the Pacific, Africa and the Americas that showed that, PWDs are actively engaged in agricultural activities such as gardening, growing fruit trees and livestock keeping (New Agriculturist, 2013).

Table 4.2 Agricultural Activities carried out by PWDs

Agriculture Activities	Do you engage in this agricultural activity		Total (%)
	Yes (%)	No (%)	
Food crop farming	100.0	0.0	100.0
Cash crop farming	14.1	85.9	100.0
Livestock Rearing	51.3	48.7	100.0
Agro Processing	0.6	99.4	100.0
Agro produce marketing	3.8	96.2	100.0
Agro input marketing	0.6	99.4	100.0
Shea nut picking to sell	3.2	96.8	100.0

Source: Analysis of Field Survey Data, 2017

4.2.2 Farm Attributes of PWDs

The results of the study as shown in Table 4.3, portrays that, an overwhelming majority (94.2%) of disabled farmers cultivate maize, with 53.8% cultivating groundnut while 51.3% cultivate rice. These crops come under the category of food crops which are essential to ensure food security. PWDs mainly cultivate these crops to ensure that their households are food secure.

This finding agrees with the findings of a study in rural Kenya that showed that majority of disabled farmers cultivated maize (N'gang'a, 2013). From Table 4.3, it is also evident that disabled farmers obtain low yield.

Using the production levels of the Savelugu-Nanton Municipality as a reference, it can be seen that, disabled farmers are unable to obtain much output compared to their abled counterparts, (MADU, 2017). For instance, the yield for maize for the year 2016 was 30 bags per hectare of land cultivated (MADU, 2017). Likewise, the yield for rice for 2016 was 47.2 bags per hectare of land cultivated (MADU, 2017). From these figures, it is evident that, the yield obtained by disabled farmers is insignificant compared to the Municipal average. In addition, the average farm size for disabled farmers seems to be low compared with the average farm size of abled farmers which was estimated at 4.8 hectors in 2015 (WFP, 2016). Many respondents attributed this to the numerous constraints they face ranging from inadequate resources and equipment, unfavourable weather, land infertility, inadequate access to credit among others. This implies that, the yield obtained by PWDs may not be able to sustain their households till the next harvest, thereby worsening their food insecurity. PWDs in the Municipality suffer from multiple deprivations due to poverty, ill health and food insecurity. This goes in line with the fact that, globally, 161 children under five were estimated to be stunted due to malnutrition in 2013 and about half of all stunted children lived in Asia and over one third in Africa (UNICEF, WHO, & The World Bank, 2014a). Also, a food security assessment conducted in Ghana estimated that about 19% of children less than 5 years of age are stunted (WFP, 2016).

The study also shows that disabled farmers surveyed have been in agriculture for many years now. This can be attributed to the fact that farming is the main occupation

of the people hence PWDs start owning farms from the age of 17 onwards even though children start going to the farm from the age of 7 if they do not attend school.

Table 4.3 Farm Attributes of PWDs

Crops	Do you grow this crop		Total	Descriptive Statistics		
	Yes	No				
	%	%	%	Av. Farm Size (Ha)	Av. Output (Bags)	Av. Experience (Years)
Maize	94.20	5.80	100.00	3.65	10.11	22.42
Rice	51.30	48.70	100.00	3.94	13.99	22.51
Millet	4.50	95.50	100.00	1.30	2.00	26.60
Groundnut	53.80	46.20	100.00	2.51	8.53	19.63
Soybean	14.10	85.90	100.00	2.00	5.31	16.38
Cowpea	3.80	96.20	100.00	0.92	2.18	25.67
Yam	4.50	95.50	100.00	0.86	116.86	30.29
Pepper	3.20	96.80	100.00	2.60	4.00	18.60
Okro	5.10	94.90	100.00	0.50	0.81	8.63

Source: Analysis of Field Survey Data, 2017

4.2.3 Type of Disability and Farm Holding

The study examined the extent to which type of disability (physical and sensory) affect disabled farmers access to land and farm holding, measured in terms of farm size. To test the significant difference between farm holding of physically and sensory disabled farmers, independent t – test was applied and the results show in table 4.4. As shown in the Table 4.4, the study found no significant difference in farm size of physical disabled farmers and sensory disabled farmers of all the crops grown by disabled farmers. Thus type of disability does not significantly affect disabled farmers farm holdings.

From table 4.4, the mean farm sizes for maize for both physically disabled and sensory disabled are the same (3.74). The t value obtained is 0.002 and the P value is 0.998, which proves that there is no significant difference between the farm holding

for physically disabled farmers and sensory disabled farmers. This implies that one's type of disability does not significantly determine his or her farm holding with regards to maize. This could be attributed to the fact that maize is a staple crop that is cultivated to feed the household. Same can also be said for rice because the farm sizes for both physical and sensory disabled farmers in 4.00 and 4.01 respectively. The t value for rice is -145 and the P value is 0.885. This shows that there is no statistical significance between the farm holdings for physically and sensory disabled farmers. Since rice is also a food crop that is grown by majority of the population, it is assumed that irrespective of one's type of disability, he or she is most likely to cultivate rice to feed his or household. This finding agrees with the findings of N'gang'a (2013) in her study in rural Kenya where majority of the respondents cultivated maize.

In addition, table 4.4 shows that there is no statistical significance in farm holding between physically disabled and sensory disabled farmers for the other crops namely, Millet, Groundnut, Soybean, Cowpea and Yam. It can therefore be concluded that there seems to be no statistical significance between the farm holdings of physically disabled and sensory disabled farmers for the various crops.

Table 4.4 Type of Disability and Farm Holding

Crops	Type of Disability				Test Statistics		
	Physical		Sensory				
	Mean Farm Size	SD	Mean Farm Size	SD	t	df	P
Maize	3.74	2.45	3.74	2.21	0.002	134	0.998
Rice	3.98	2.42	4.07	2.96	-0.145	69	0.885
Millet	0.50	1.23	1.50	1.68	-0.531	3	0.632
Groundnut	2.43	1.30	2.61	1.34	-0.603	79	0.548
Soybean	1.82	0.98	2.18	0.98	-0.869	20	0.395
Cowpea	0.750	0.35	1.00	0.00	-1.000	2	0.423
Yam	1.00	0.00	0.83	0.26	0.598	5	0.576

Source: Analysis of Field Survey Data, 2017

4.2.4 PWDs and Rearing of Livestock

The result of the analysis of type of livestock reared by disabled farmers surveyed is shown in Table 4.5. As shown in the Table, it is evident that many (46.1%) disabled farmers keep local fowls with an average stock of 14.56 birds, yielding an average annual income of GH¢ 52.33. They were also found to have an average of 33.37 years of experience in local fowl keeping. It is evident that, although fowls are the highest reared animals among disabled farmers surveyed, they seem to yield the least incomes. This can be attributed to the fact that majority of the respondents lamented that their fowls die in large numbers during the harmattan season. Also, PWDs lack accesses to veterinary services to enable them vaccinate their fowls and obtain other medical support. This creates a vicious cycle where disabled farmers keep fowls and have to later loose them to diseases or sell them off cheap.

Also, about 16.77% of respondents reared rear guinea fowls with an average stock of 13.2 birds per respondent, bringing an average annual income of GH¢ 118.00. The average years of experience in rearing guinea fowls among the disabled farmers interviewed was found to be 16.23 years (Table 4.5). Although few PWDs reared guinea fowls, their average annual income appears to be higher than that of local fowls. This could be indicative of the fact that the market value of guinea fowl is higher than local fowl. Hence, the few PWDs who succeed in rearing guinea fowls are likely to get a relatively better income than PWDs who rear local fowls.

Regarding the rearing of small ruminants, the study found that about 28% and 26% of the disabled farmers interviewed indicated that they reared goats and sheep respectively. The average stock of goat and sheep per respondent, as at the time of the field survey, was 5.77 and 8.22 respectively, with an average annual income accruing from the sale of goat and sheep being, GH¢209.79 and GH¢283.33 respectively.

However, there appears to be a difference in the years of experience in keeping goats and sheep. The average experience in rearing goats is relatively higher (30.65) than the average experience in rearing sheep (11.32).

The result of the survey as presented in Table 4.5 shows that a small number of disabled farmers rear cattle (6.4%) with an average stock of 16.3 and average annual income of GH¢ 2775.00. Despite the fact that few PWDs are able to rear cattle, their average stock and annual income appear to be high. This could be attributed to the high premium given to cattle. Cattle are among the most expensive livestock and also much attention is given to cattle by veterinary officers. Disabled farmers who rear cattle are considered wealthy in their society. Pigs were found to be rarely kept by disabled farmers, with just 2 farmers (representing 1.3%) indicating they rear pigs, with average stock per person, as at the time of the survey, being 14, bringing in an average annual income of GH¢ 1150.00. This could be attributed to the fact that the Savelugu-Nanton Municipality is a Muslim dominated area and Islam prohibits the rearing and consumption of pork. However, the average annual income from the sale of pigs appears to be relatively high.

Table 4.5 Livestock Reared by PWDs

Livestock	Do you keep this animal		Descriptive Statistics		
	Yes	No			
	%	%	Average Stock	Income (GH₵)	Experience (Years)
Goat	27.60	72.40	5.65	209.79	30.65
Sheep	25.60	74.40	8.23	283.33	11.32
Cattle	6.40	93.60	16.11	2775.00	14.38
Pig	1.30	98.70	14.00	1150.00	13.50
Fowls	46.10	53.80	14.65	52.33	33.37
Guinea Fowl	16.70	83.30	13.19	118.00	16.23

Source: Analysis of Field Survey Data, 2017

4.2.5 Livestock Holding and Type of Disability

To assess the effects of type of disability on livestock holding, independent t – test was applied on the mean stock of the various livestock kept by disabled farmers surveyed. The result of the analysis is shown in Table 4.6. The test failed to established significant relationship between type of disability and livestock holdings. Thus type of disability as either physical or sensory does not affect disabled farmers livestock holding.

As shown in Table 4.6, the mean stock for goat of physically disabled and sensory disabled farmers appears to be very close (6.23 and 5.05 respectively). The t value obtained is 0.537 and the P value is 0.594. This implies that there is no statistically significant difference between the mean stock of goat kept by physically disabled and sensory disabled farmers. Similarly, as shown in Table 4.6, there is no statistically significant difference in the mean stock of physically disabled and sensory disabled farmers in relation to the other animals namely, sheep, cattle, fowl and guinea fowl.

It can therefore be said that, a person being physically disabled or sensory disabled does not affect a person's ability to rear livestock in the Savelugu/Nanton Municipality.

Table 4.6 Type of Disability and Livestock Holding

Livestock	Type of Disability				Test Statistics		
	Physical		Sensory				
	Mean Stock	SD	Mean Stock	SD	t	df	P
Goat	6.23	8.85	5.05	4.89	0.537	41	0.594
Sheep	8.16	7.69	8.33	10.98	-0.059	38	0.954
Cattle	19.67	19.14	14.33	17.82	0.414	7	0.691
Fowls	13.95	18.33	15.66	24.09	-0.338	69	0.736
Guinea Fowl	1.80	0.40	1.84	0.37	-0.592	143	0.555

Source: Analysis of Field Survey Data, 2017

4.3 Concerns of PWDs in Extension Delivery

The majority of farmers in northern Ghana are small-scale farmers who depend mainly on agriculture for their livelihoods. To enable farm households meet their family food and financial demands, small-scale farmers especially those who dwell in rural areas are obliged to adhere to good agricultural practices in other to increase their productivity (Elifadhili, 2013).

However, rural farmers face many challenges with regards to access to suitable knowledge, improved and innovative technologies, credit facilities and other relevant social services (Mbo'o-Tchouawou & Colverson, 2014). For PWDs, the situation could be far worse due to the intersection of poverty and disability (Groce *et al.*, 2011).

4.3.1 Extension Service Delivery in the Savelugu-Nanton Municipality

As a major partner in agricultural development, extension services is tasked with the responsibility of transferring improved agricultural technology to the farmers as well as assist them to secure micro loans to enable them increase farm productivity to improve their livelihoods. After independence, Ghana tried various extension approaches including extension under the farmers' cooperative movement (MOFA, 2002).

The beginning of the 1990s saw the adoption of the Training and Visit (T&V) extension system nationwide by the Directorate of Agricultural Extension Services. This extension initiative was supported with funding from the World Bank through the National Agricultural Extension Project (NAEP).

Over the years, efforts to improve the lives of PWDs continue from government agencies and NGOs through agricultural extension but the demand for extension

services far exceeds available resources (Ali-Olubandwa, Kathuri, & Wesonga, 2011). The current extension to farmer ratio is 1:3000 (MOTI, 2015).

This means that one extension officer is required to take care of about 3000 farmers. This is highly disproportionate and no effective extension service can be extended to farmers under this current situation.

Extension officers in the Savelugu-Nanton Municipality stated among their core duties as:

- Offer training to Farmer Based Organisations (FBOs) to be self-reliant and self-sustaining.
- Help farmers identify agricultural challenges and assist them find solutions.
- Organise home and farm visits.
- Assist in the formation of farmer groups.
- Organise field demonstrations and trials.
- Educate farmers on post-harvest management practices.
- Educate farmers on good nutritional practices to prevent diseases.

One extension officer lamented,

> *"I have never received any training on how to offer extension services to PWDs. The hearing impaired farmers in my zone are treated the same as any other farmer".*

Such was the case for all the extension officers interviewed. This implies that, the needs of PWDs have not been considered in the planning and implementation of agricultural initiatives over the years.

PWDs are treated like any other farmer in the provision of extension services. It was also observed that very few disabled farmers had ever come into contact with extension officers and this was confirmed by the extension officers.

Many extension officers in the Municipality do not offer services to PWDs. This can be attributed to the fact that, Disabled Persons Organisations (DPOs) in the Municipality do not have a strong voice with regards to agriculture. PWDs who are able to join FBOs in their communities are the lucky few who may be able to get assistance from extension officers.

Extension officers are overburdened in dealing with general service delivery challenges and as such have very little time to deal with the individual and unique challenges of PWDs. Extension officers in the Municipality lamented about the various challenges and constraints they face in providing services to farmers. Some of the challenges include;

- Inadequate tractor services in the communities.
- High cost of inputs especially improved seeds.
- No ready market for farm produce.
- Inadequate resources for agricultural activities.
- Low technology adoption.
- Inadequate storage facilities to store seeds and other supplies for farmers.

- No fuel to conduct visits.
- Inadequate logistics.
- Poor maintenance of machinery.
- No skills in sign language and the use of braille.
- No risk allowance apart from salary.

4.4 Influence of Extension Service Delivery on PWDs Access to Extension Services

A fully inclusive society is one that recognises and values the equal participation of disabled people. Reasonable and attainable access to buildings for PWDs is acknowledged in the United Nations Convention on the Rights of Persons with Disabilities (McLeod, Perese, Croft, Rowland & Grant, 2014, & UNCRPD, 2016). For this reason, planning and designing for the majority should take into account the requirements of PWDs (Baris & Uslu, 2009).

The principles of inclusive design aim to accommodate the broadest range of dimensions and movements, in the belief that designers and manufacturers should ensure that buildings, products and services address the needs of the widest possible audience including PWDs (Danso, Ayarkwa, & Dansoh, 2011).

The Ghana Standards on Accessibility Design (GS 1119) is a useful tool for those involved in the designing, implementation, supervision, and decision-making of various interventions and programmes where accessibility to PWDs is a component (Frempon-Ntiamoah, 2017). These standards are to be applied during the design, construction and alteration of all buildings for public use (Frempon-Ntiamoah, 2017).

4.4.1 Sources of Agriculture Information for PWDs

As shown in Figure 4.2, almost half of the respondents (42.9%) affirmed that their main source of information was from colleague farmers, friends and relatives. This can be attributed to the fact that most disabled farmers do not belong to Farmer Based Organisations (FBOs). This makes them rely heavily on their friends and relatives for agricultural information (Figure 4.2). This implies that PWDs in the Municipality generally have a very good support system where they are able to get information from their friends and family.

The next most frequent source of agricultural information for PWDs is radio and mass media, with about 36.5% of the respondents indicating that they mostly sourced their agricultural information from radio and other mass media (Figure 4.2). From the study, it was observed that almost all the respondents had access to radio and a few had television sets in their homes. Radio is an integral part of the lives of rural populations and the Savelugu-Nanton Municipality is no different. One respondent said,

> "*For some months now my radio is spoilt so whenever I want to listen to the radio, I go to my neighbour's house to listen to the radio with him.*"

In recent times, efforts have been made by several organisations such as Farm Radio International as well as the radio stations to include agricultural programmes in their broadcasts. Rural dwellers are able to listen to these agricultural programmes and also call into these agricultural shows to ask questions related to agriculture. PWDs in the Savelugu-Nanton Municipality make good use of the radio to obtain agricultural information. One respondent in the Savelugu town stated that;

''We are told when to plant and also how to identify pests and diseases on our crops. If you are able to follow the guidelines given on the radio, you will be able to obtain good yield.''

The few PWD farmers who are unable to access the radio lamented that their radios were either spoilt or they could not afford to buy batteries to power their radios. This goes on to highlight the vital role that radio plays in agricultural extension and agrees with the findings of Chapman, Blench, Kranjac-Berisavljevic and Zakariah (2003) that, **r**ural radio is an important tool that can be used to improve the sharing of agricultural information by remote rural farming communities. They also stated that, participatory communication techniques can complement agricultural extension efforts especially when rural radio stations employ local languages to communicate directly with farmers and listeners' groups (Chapman, Blench, Kranjac-Berisavljevic & Zakariah, 2003).

In addition, the results in Figure 4.2 show that a small percentage of PWDs responded that their main source of information was from MOFA and NGO extension workers (9.6% and 6.4% respectively). These persons were mostly literate and belonged to FBOs in their communities. This implies that, a disabled farmer is more likely to receive extension services if he or she belongs to a FBO. This draws attention to the fact that, PWDs are often excluded in extension delivery from both governmental and non-governmental agricultural extension service providers. Many of the respondents remarked that they had never been visited by extension officers.

Also, it can be observed from Figure 4.2 that certain disabled persons observe with their eyes and also make use of their own knowledge. This small group of PWDs is mostly sensory disabled. Due to the nature of their disability, they cannot hear what is

being explained so they have to only observe with their eyes and replicate same on their farms. The few sensory disabled farmers who belong to FBOs do not have the opportunity to participate in group meetings and activities due to the fact that, extension officers are not trained to use braille to assist sensory disabled farmers.

In the Municipal Agricultural Development Unit of the Savelugu-Nanton Municipality, the main office building has sliding entrances that are disability friendly. This is where the Municipal Director's office is situated. The veterinary office is however not disability friendly.

The Director of agriculture remarked that since he took over, there has not been a planning session in the Municipal Agricultural Office.

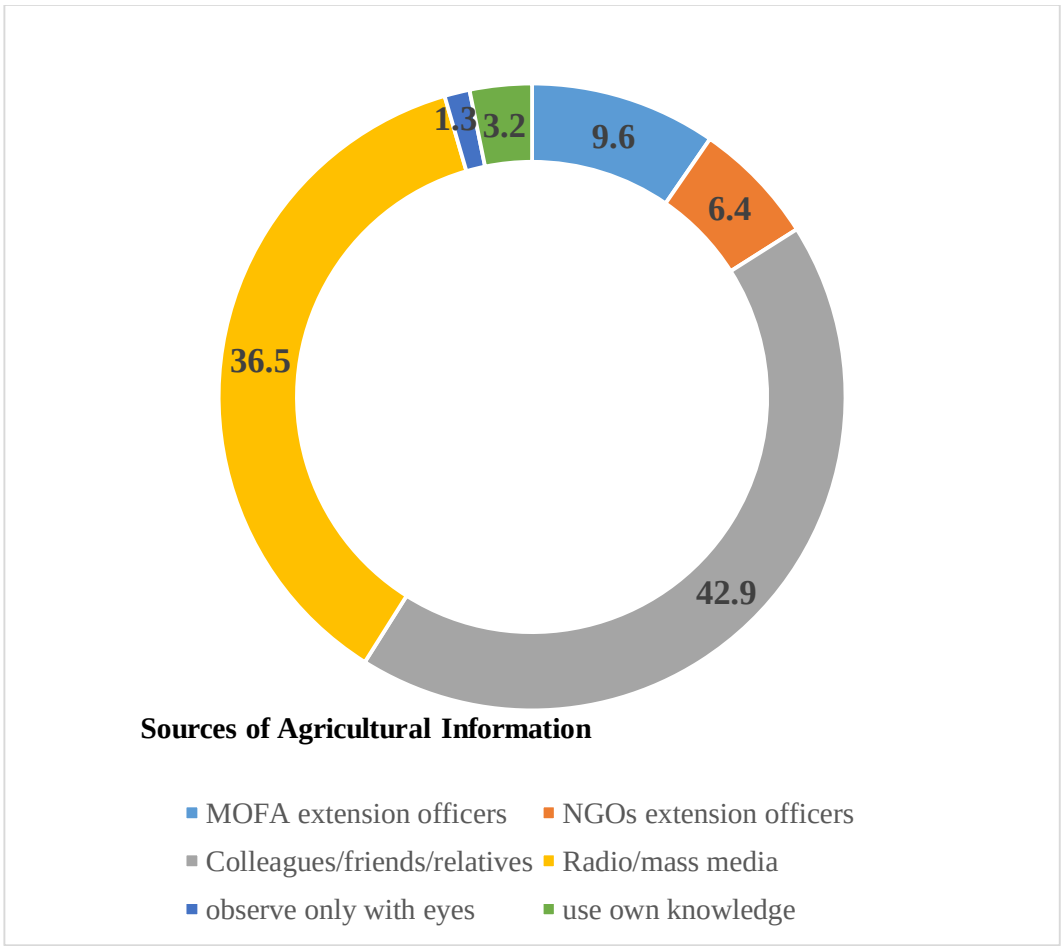


Figure 4.2 Sources of Agricultural Information
Source: Analysis of Field Survey Data, 2017

4.4.2 Specific Agricultural Information Accessed by PWDs

The results of analysis of information gathered on specific information mostly sourced by the disabled farmers are presented in the Figure 4.3. As shown in the Figure 4.3, crop varietal information is the most sourced information by PWDs. Majority (84%) of the disabled farmers surveyed indicated they ever sourced information on improved crop varieties. This is closely followed by planting and land preparation information (83.30%).

This could be attributed to the fact that disabled farmers experience low yield hence they will require information that will assist them to know the most viable seeds to plant (Figure 4.3).

In addition, disabled farmers will need information on the most appropriate time to prepare their farms for planting to achieve maximum yield. Due to climate variability, rural farmers need requisite information on the best coping mechanisms to assist them increase their yield as well as minimize food insecurity. This agrees with the assertions by Ogalleh, Vogl, Eitzinger, and Hauser (2012) that, improvements in agriculture can be achieved if rural smallholder farmers are targeted. This can be done by harnessing and improving the local knowledge of smallholder farmers on climate change and variability in other to enhance their adaptive capacity (Ogalleh, Vogl, Eitzinger, & Hauser, 2012).

In addition, weed control, harvesting and post harvesting information are accessed by PWDs in the Municipality (76.9% and 69.9% respectively). This could be attributed to the fact that many disabled farmers in the Municipality complained about post-harvest losses as well as weed invasion on their farms. One respondent remarked,

''Last season, weeds invaded my farm and destroyed my crops. This made my yield very poor.''

Rural farmers especially PWDs need information on how to identify weeds early to prevent the loss of their crops as well as best post-harvest practices.

The result of figure 4.3 shows that 26.9% of PWDs in the Municipality access information on livestock production. This clearly shows that livestock keepers among PWDs in the Municipality are few.

From Figure 4.3, marketing information is the least accessed by PWDs in the Municipality, (11.50%). This could be attributed to the fact that, majority of disabled farmers in the Municipality practice subsistence farming to feed their families. Respondents lamented that their yield hardly sustains them throughout the year hence they do not engage in marketing activities. Majority of PWDs in the Municipality have to supplement their household food by purchasing from the market. This agrees with recent studies that show an increase in the reliance on market purchases by both urban and rural households. This has led to an increase in food expenditures by 60–80% of the total household income for low-income households in some parts of sub-Saharan Africa (Baiphethi & Jacobs, 2009).

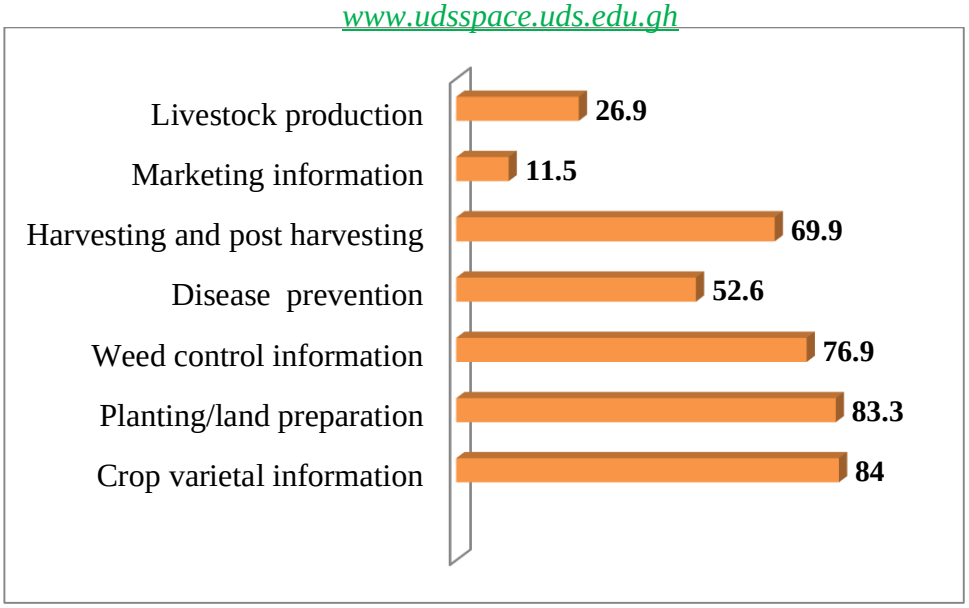


Figure 4.3 Specific Agricultural Information Accessed (%)
Source: Analysis of Field Survey Data, 2017

4.4.3 Disabled farmers' Perceived Degree of Access to Agricultural Information

Disabled farmers' access to agricultural information was measured on a Likert scale as 'very accessible' if respondents have unimpeded access to agricultural information and 'somewhat accessible' if there is some level of hindrance in their access to agricultural information. A result of the assessment of disabled farmers' access to agricultural information is presented in Figure 4.4.

The results as shown in the Figure 4.4 indicates that majority (73.1 %) of the disabled farmers surveyed scored their access to agricultural information as 'very accessible'. Disabled farmers are able to obtain agricultural information from informal sources such as from their FBOs, their relatives and friends, radio and television. Apart from these informal sources, disabled farmers in the district hardly source agricultural information from formal sources such as from MOFA and NGO extension agents. This implies that, a large majority of disabled farmers in the Municipality are not discriminated against with regards to sharing agricultural information with their

relatives, friends and colleague farmers. Many respondents attested to the fact that, they received agricultural information from their non-disabled relatives who mostly belong to FBOs. It was evident from the study that, the people respected their relatives and colleague farmers irrespective of their disability status. A disabled person who is the head of the family has access to agricultural information either through the media, or through his or her relatives.

In addition, 23.7% of PWDs in the Municipality responded that agricultural information is somehow accessible to them.

This group of disabled farmers stated several issues ranging from frequent travel for trading activities, inability to buy batteries and a few visits from extension officers as some the reasons why agricultural information is somehow accessible to them.

As shown in the figure 4.4, only 3.2% of PWDs responded that they did not have any access to information. This small minority consisted of indigenous disabled farmers who preferred to use their own knowledge to farm. One disabled farmer said,

> *"I use my own knowledge by observing the rainfall pattern. After the first rain, I prepare my land for planting.''*

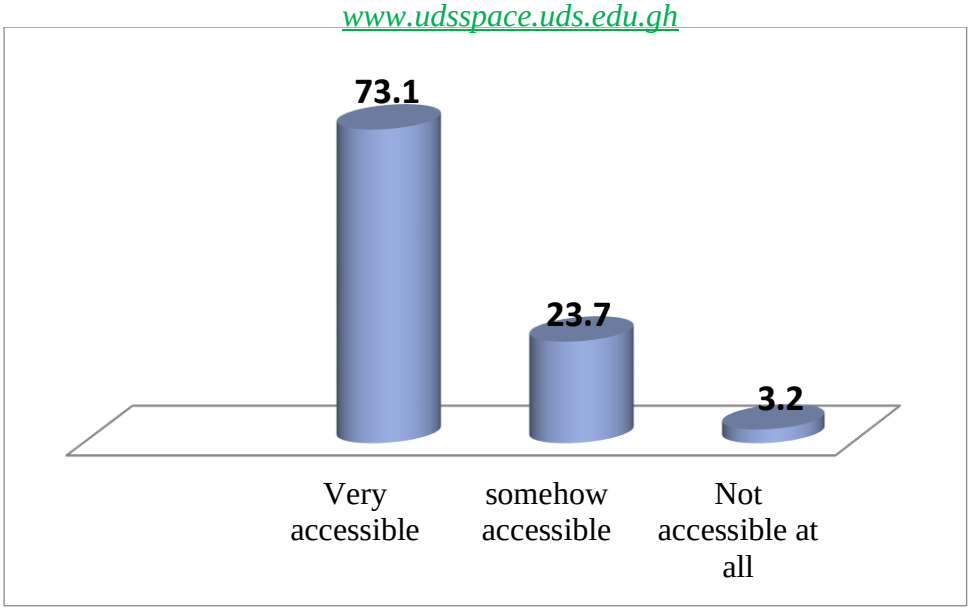


Figure 4.4 Perceived Degree of Access to Agricultural Information
Source: Analysis of Field Survey Data, 2017

4.5 Determinants of Effective Participation of PWDs in Agriculture

The National Disability Law (2006), Act 715 makes provisions to protect the rights of PWDs in employment related issues. In addition, the Ghana Labour Law (2003), Act 651 also makes similar provisions for the employment of Persons With Disabilities in the Labour force of Ghana (Mensah *et al.*, 2008). There is however, no mention of agricultural related activities, even though majority of disabled persons are farmers (FAO, 2006). This section seeks to bring to bear the factors determining the participation of PWDs in agriculture in the Savelugu/Nanton Municipality.

4.5.1. PWDs Participation in Agriculture

From information obtained from the analysis of participation of PWDs in agriculture, two main forms of participation were identified. These are '**participation through labour contribution,**' in which disabled persons merely contribute their labour in carrying out their household farming activities but exert no control over production and marketing decision. And '**participation through decision making**' in which

PWDs participate in agriculture by having control over or participate in the decision on what to produce, how to produce it, when to sell and how to use the produce. For those who participate through decision making, they were further classified into '**participating in both production activities and decision**' and '**participate in only decision making**'. Those who by the virtue of their disabilities or other reasons are unable to participate in carrying out production activities but control decision making on production and marketing were classified as '**participating by decision**' while those who have control over production and marketing decision and also physically partake in production activities were further classified as '**participating by activities and decision'**. In general, the study classified participation of PWDs in agriculture into:

- Participation through labour contribution
- Participation by decision
- Participation by activities and decision making

As such the forms of participation in agriculture of the PWDs interviewed were assessed as presented in Figure 4.5. As shown in the figure, about a third (33%) of the 156 PWDs surveyed was found to be participating in agriculture by mere labour contribution. They were merely involved in carrying out agricultural production activities such as land preparation, sowing, weeding, harvesting among others on farms owned by other members of their households, mainly the heads of their households. Women and young PWDs were found to belong to this category of participation. Due to the multiple discriminations and constraints women with disabilities face, their participation in agriculture was found to be limited to using their labour to undertake unpaid agricultural activities, with very few of them

receiving rewards and payment for work done. One woman with disability interviewed, refused to be referred to as a farmer, and explained that,

> ''*My husband owns the farm, I only take part in sowing, weeding, cooking food for the workers, harvesting .... And because of the condition of my legs I cannot carry much load, so it is my husband who does most of the farm work.*''

This demonstrates the fact that, in spite of the enormous contribution of women living with disabilities in agriculture, their contribution is not acknowledged and they themselves have been conditioned to think they do not do much. This form of participation of PWDs in agriculture exposes them to labour exploitation (Figure 4.5).

Also 28% of the 156 PWDs interviewed were found to participate in agriculture by decision only without partaking in production activities. This category mainly comprises of the elderly who are usually the head of their households and as such have control over production decision but because of their age, they do not physically take part in production activities. Notwithstanding, they decide what to produce and how the income should be utilized. Also, most of the visually impaired respondents were also found to belong to this category, even though a number of them actually take part in production activities in spite of their visual limitations.

In addition, 39% of the 156 PWDs surveyed participate in agriculture by both production activities and decision making. Due to their age and notwithstanding their disabilities, they actively take part in production activities and also owned their farms and as such, have control over production and marketing decisions. This active labour force is the main contributor to the food security of their households. This assertion

agrees with the statement by FAO that a large proportion of the disabled people are farmers with responsibility for the food security of their households (FAO, 2006).

Participation in labour markets, especially in agriculture and high-value crops among men and women smallholder farmers has always been an important strategy for poverty alleviation and attainment of food and income security (Carletto, Covarrubias, & Krausova, 2007, & Zakaria, 2016). Zakaria (2016) argued that, it is only when smallholder women farmers, and for that matter marginalised members participate in high-return agricultural activities such as cash crop enterprise that they are able to share the economic benefits accruing therein.

However, if marginalised farmers participate merely through labour contribution, they are likely not to benefit economically, unless they are involved in the decision-making regarding the production and the use of income generated from the production process.

As such, disabled farmers whose participation in their households' agricultural activities was merely labour contribution were regarded as not effectively participating in agriculture since they are likely not to benefit economically. While those who were involved in the decision regarding the production and use of income and produce from their households' farming enterprises were regarded as participating effectively in agriculture.

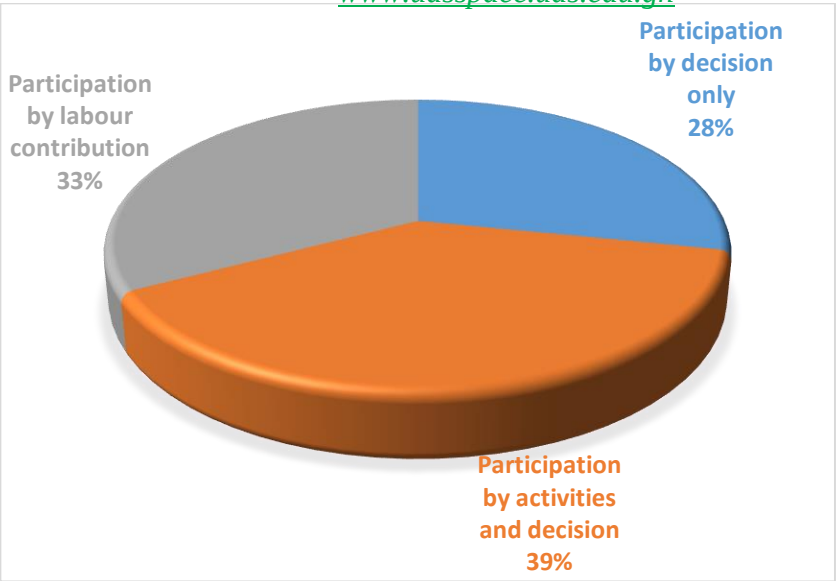


Figure 4.5 Categories of Participation of PWDs
Source: Analysis of Field Survey Data, 2017

4.5.2 Type of Disability and Participation in Agriculture

In order to assess the effects of type of disability as 'physical disability', 'sensory disability' or both on participation in agriculture, a cross tabulation shown in the Table 4.7 was examined. As shown in the table, about a third (36.4%) of disabled farmers who participated in agriculture by decision only were physically disabled, while about half (50%) were sensory disabled and the remaining 13.6% were both physically and sensory disabled. The results show that sensory disabled farmers, such as visually impaired, were more likely to participate in production and marketing decision in agriculture, even though they might not be physically involved in carrying out farming activities, compared with their physically disabled counterparts. This finding is instructive, as it clearly demonstrates that in spite of their sensory impairment which might impede their ability to physically undertake farming operations; disabled farmers do participate in their households' decision making regarding agricultural production and marketing (Table 4.7).

Also, as shown in the Table 4.7, more than half (55.7%) of disabled farmers whose' participation in agriculture was described as participation by activities and decision were physically disabled farmers while 36.1% and 8.2% of them were sensory disabled and both physical and sensory disabled respectively. Thus, physically disabled farmers were found more likely to partake in both decision and farming activities by physically performing farming tasks such as weeding, sowing, harvesting among others, compared with their counterparts who were sensory disabled. Sensory impairment is more likely to impede farmers' ability to physically undertake farming tasks than physical disability. Physically challenged farmers such as amputees (either arm or leg) were found on the field working on their farmlands unaided. Farming activities such as weeding, sowing, fertilizer application and harvesting can easily be undertaken by physically challenged farmers compared with sensory impaired farmers such as visually impaired.

However, hearing impaired farmers who had been classified as sensory impaired can equally undertake these activities compared to their physically challenged counterparts.

At one of the focus group discussions, a hearing impaired participant speaking in sign language, observed that,

> *''There is nothing that abled farmers can do and I cannot do, but the agriculture people do not consider us as farmers.''*

For those whose' participation in agriculture was classified as 'participation by labour contribution' a little over half (51%) of them were physically disabled while the remaining 49% were sensory disabled. Thus, more physically disabled farmers were contributing their labour in working on other people's farmers, mostly their household

heads than sensory disabled farmers. Also, more physically disabled farmers are more likely to have their labour being exploited in agriculture in which they contribute their labour in undertaking farming activities on farms owned by other household members of which they have no control over production decision compared with their sensory disabled counterparts. Such kind of participation does not benefit disabled farmers and exposes them to further exploration and deprivation.

However, the results prove that, even with more than one type of disability, Persons With Disabilities can participate in agriculture (Table 4.7). This goes on to affirm the fact that, PWDs can, and want to be productive members of society. Productive and decent work enables Persons with Disability to realize their aspirations, improve their living conditions and participate more actively in society (New Agriculturist, 2013, Leonard Cheshire Disability, 2013).

Table 4.7 Type of Disability and Participation in Agriculture

Type of disability		Type of Participation			Total
		Participation by decision only	Participation by activities and decision	Participation by labour contribution	
Physical disability	Count	16	34	26	76
	% within Type of Participation	36.4%	55.7%	51.0%	48.7 %
Sensory disability	Count	22	22	25	69
	% within Type of Participation	50.0%	36.1%	49.0%	44.2 %
Both	Count	6	5	0	11
	% within Type of Participation	13.6%	8.2%	0.0%	7.1%
Total	Count	44	61	51	156
	% within Type of Participation	100.0%	100.0%	100.0%	100.0 %

Source: Analysis of Field Survey Data, (2017)

4.5.3. Factors Influencing Participation of PWDs in Agriculture

For several decades, participation in labour markets has always been an important strategy for poverty alleviation and the attainment of food security among marginalised members of society (Carletto, Covarrubias, & Krausova 2007, cited in Zakaria, 2016). For instance, it is only when disabled farmers participate in high-returns agricultural activities such as cash crop enterprise that they are able to share the economic benefits accruing therein. However, if disabled farmers participate merely through labour contribution in their households' farm enterprises they are likely not to benefit economically, unless they are involved in the decision-making regarding production and the use of income generated from the production process.

As such this study sought to examine the factors influencing disabled farmers participation in production and marketing decision of their farming enterprises.

Two forms of participation in agriculture were considered. These are '**participation through labour contribution**' in which disabled persons merely contribute their labour in carrying out their household farming activities but exert no control over production and marketing decision. And '**participation through decision making**' in which PWDs participate in agriculture by having control over or participate in the decision on what to produce, how to produce it, when to sell and how to use the produce. This form of participation (**participation through decision making**) is considered in this study as effective participation. Respondents whose' participation in agriculture were merely through labour contribution were coded as zero (0) and those who participated through decision were coded one (1) to produce a dichotomy binary variable. As a result, probit regression as a binary choice model was applied in assessing determinants of effective participation of PWDs in agriculture.

The use of the probit regression model and selection of independent variables were guided by Random Utility Theory and social theory within the context of access and disability theories such as the social and human rights models of disability. Descriptive statistics of variables entered in the probit and the results of the probit regression model is shown in tables 4.8 and 4.9 respectively.

As shown in Table 4.8, about 70% of the PWDs surveyed are effectively participating in agriculture by having some level of control, and actively participating in production and marketing decision, while about a third were merely participating by labour contribution. The average age of disabled farmers interviewed is about 43 years with the age range of 17 to 70 years. Majority of the respondents were male with only 30% having some level of formal schooling. Half of the respondents indicated they have access to labour with only 30% indicating they have ever taken credit for farming.

Table 4.8 Descriptive Statistics of Variables used in the Model

Variable	*Mean*	*Standard deviation*	*Min*	*Max*
Participation	0.7	0.5	0	1
Age	43.4	14.9	17	70
Sex	0.7	0.5	0	1
Education	0.3	0.4	0	1
Marital Status	0.6	0.5	0	1
Type of Disability	0.5	0.5	0	1
Household Size	9.5	6.4	2	38
Membership of FBO	0.2	0.4	0	1
Power HH decision	0.5	0.5	0	1
Access to labour	0.5	0.5	0	1
Access to credit	0.3	0.4	0	1
Farm Size	3.6	2.2	0	15
Experience in Farming	22.4	16	3	60

Source: Analysis of Field Survey Data, 2017

4.5.4 Determinants of PWDs Participation in Agriculture

Results of the regression analysis as shown in table 4.9, shows that the empirical model is a significant determinant of effective participation of PWDs in agriculture (see LR chi^2 (12) = 24.83: Prob > chi2 = 0.0096). Out of the twelve (12) independent variables entered in the model, nine (9) were found to be significant determinants of effective participation of PWDs in agriculture. These nine (9) significant variables jointly explained about 71% of the variation in PWDs effective participation in agriculture (see Pseudo R^2 = 0.707).

As shown in the Table 4.9, while age, sex, education, household size, access to labour were significant at less than 1% level of significance, membership of FBO, power in household decision making and farm size were found to be significant at less than 5%. However, variables such as marital status, type of disability and experience in farming were found not to be significant determinants of PWDs effective participation in agriculture.

As shown by the sign of coefficients (Table 4.9), age and sex were found to be positive determinants of PWDs effective participation in agriculture, implying that older and male disabled farmers were more likely to be effective participants in agriculture compared with young and female farmers. This confirms the widely held assertion that gender further worsens the plight of PWDs with its negative consequences on women farmers' access to and control over productive resources, agricultural information and market (Disabled Women's Network, 2007). Gender insensitive land tenure systems in northern Ghana which constrains women farmers' access to and control over agriculture land coupled with societal discrimination against PWDs further puts additional burden on women disabled farmers effective participation in agriculture. Gendered power relations give rise to discrimination,

subordination and exclusion in society, particularly when overlaid across other areas of marginalization due to class, ethnicity, caste, age and disability status as observed by Jost (2014).

In developing an all-inclusive and mainstreaming the concerns of marginalized groups in agriculture, there is the need to understand how gender norms and relations, along with other critical factors such as ethnicity, age and disability affect differences in access, power and decision making with regards to agriculture and farm related enterprises.

Similarly, the variable education was found to be positively related to effective participation of PWDs in agriculture. This indicates that, literate disabled farmers were more likely to participate effectively in their household agricultural production and marketing decision compared with their illiterate counterpart. Education has been found to be associated with improving intra-household power relations in decision making. Zakaria (2016) examined drivers of women farmers' participation in cash crop production and identified education as a significant driver of intra-household power relations such as women participation in household decision making, control over household productive resources and control over household income. Similarly, Carletto *et al.*, (2007) found education and training as a sustainable way of improving labour market participation among marginalised members of society.

Also, variables such as household size, membership of FBOs and access to labour in addition to access to credit were all positively related to effective participation of PWDs in agriculture. Thus, disabled farmers from large households were more likely not to have their labour exploited in undertaking activities of other household members' farms. Agricultural activities in the study area are largely driven by

household labour sources, with limited use of hired labour (see MOFA, 2010; MOFA, 2012; & GSS, 2014). As such, large households will have more labour pool making it possible for disabled farmers to have control over their labour. Also, being a member of grassroots level farmer groupings such as FBOs makes it possible for disabled farmers to benefit from shared labour pool offered by such groupings.

As a result of their disabilities, disabled farmers faced physical constraints in undertaking some agricultural operations and as such they sometimes rely on abled farmers to assist them on their farms. Also, the design of farm tools and implements do not consider the concerns of disabled farmers making it difficult for them to use such farm tools and implements. At the focus group discussions, disabled farmers expressed serious concerns about their inability to use some of the available farm implements. One disabled farmer questioned,

> ''*Look at me, how can I use a hoe with long blade and handle, I will hurt myself in the process.*''

These limitations make disabled farmers rely on the help of other farmers within their households and farmer groups in their communities.

Access to credit and labour were also found to be positively related to effective participation of PWDs in agriculture. Disabled farmers who have ever taken credit for farming and those who have access to labour were found more likely to have engaged effectively in agriculture. They are able to overcome intra-household power challenges and participate in household production and marketing decision because they have capital (credit) and better access to labour to undertake their farming activities. They are also able to leverage on their income and labour to secure access to land, agricultural information and improved seeds.

Table 4.9 Factors Influencing PWDs Participation in Agriculture

Variable	*Coefficient*	*Std Error*	*Z*
Age	0.0725***	0.0238	3.05
Sex	0.79676***	0.33453	2.38
Education	3.17226***	0.39201	8.09
Marital Status	-0.29032	0.32049	-0.91
Type of Disability	-0.19467	0.27536	-0.71
Household Size	0.11272***	0.02665	5.64
Membership of FBO	0.79972**	0.39202	2.04
Power HH decision	0.75955**	0.32456	2.34
Access to labour	0.73018***	0.27918	2.62
Access to credit	0.73585**	0.33716	2.18
Farm Size	0.16338**	0.0749	2.18
Experience in Farming	0.00009	0.01113	0.01
_cons	0.64701	0.46902	1.38

LR chi^2 (12) = 24.83: Prob > chi^2 = 0.0096; Log likelihood = -60.340756; Pseudo R^2 = 0.707

Note: *** & ** denotes that the variable is significant at 1% and 5% respectively

Source: Field Survey, (2017)

4.6 PWDs Household Food Insecurity Situation

The fundamental contribution to food security by disabled farmers was highlighted in the world Food Summit organized by FAO in 1996. It was made known that a large proportion of the disabled people were farmers with responsibility for the food security of their households (FAO, 2006). Again, food security was defined by the FAO as,

> *"Food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life"* (FAO, 2008, *p. 1*).

Estimates from FAO suggest that one in eight people in the world (870 million) suffered from chronic undernourishment between 2010 and 2012 (FAO, 2013).

In other to build political will, design effective policies, and target the allocation of resource to agriculture, information regarding the distribution and severity of hunger

and food insecurity in the population and the characteristics, circumstances, and location of those most affected needs to be obtained. Information can be a powerful tool even though it is clearly insufficient (FAO, 2013).

The Household Food Insecurity and Access Scale (HFIAS) is a method based on the idea that the experience of food insecurity (access) causes predictable reactions and responses that can be captured and quantified through a survey and summarized in a scale (Coates *et al.*, 2007).

From table 4.10, it is evident that the largest proportion of PWDs has to eat a limited variety of food due to limited resources (69.9 %). This is affirmed by the fact that, about 46.8% of respondents said that they sometimes experience this challenge.

This has resulted in the situation where disabled persons and their households have to eat one particular variety of food for several months in a year. One respondent lamented,

> *"We have no option than to eat T.Z all the time. Sometimes I crave other foods like rice and beans but due to poverty, I cannot get it to eat."*

Also, 69.2% of respondents said they were unable to eat the foods that they preferred due to a lack of resources. This was confirmed by the fact that about 42.7% of PWDs affirmed that they experience this situation sometimes. Also, 61.5% of PWDs responded that they were compelled to eat some foods that they really did not want to eat and this was confirmed by the fact that, 42.3% of PWDs stated that they experienced this sometimes.

It can be deduced from the results that, PWDs in the Municipality have a greater challenge with regards to their access to a variety of foods to supplement their regular

meals. This goes in line with one of the domains of food insecurity with regards to limited choices in the type of food that a household eats (Coates *et al.*, 2007).

Again, the results show that, about 58.3% of PWDs have to eat smaller meals than they felt was needed due to insufficient food. This is closely followed by 54.5% of PWDs who responded that they were worried that their households would not have enough food to eat. One household head lamented,

> *"I worry a lot about our food situation. It is the first thing on my mind when I wake up in the morning and the last thing I think about when I go to sleep at night."*

In addition, 41% of PWDs stated that they had to eat fewer meals in a day due to lack of resources to get food. This led to a situation where some households do not eat anything in the afternoon to make provision for regular evening meals. It can also be observed from the table that, few PWDs and their households ever experienced complete unavailability of food. This implies that, PWDs in the Municipality face a greater challenge with regards to access to different varieties of food to supplement their regular T.Z.

Table 4.10 Frequency Distribution of Household Food Insecurity (HFIAS) of PWDs

Question	Response		How often does it happen		
	Yes	no	Rarely	sometimes	Often
	%	%	%	%	%
In the past four weeks, did you worry that your household would not have enough to eat?	54.5	45.5	23.0	43.7	33.3
In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of lack of resources?	69.2	30.8	25.5	42.7	31.8
In the past four weeks, did you or any household member have to eat a limited variety of foods due to lack of resources?	69.9	30.1	24.8	46.8	28.4
In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of lack of resources to obtain food?	61.5	38.5	35.1	42.3	22.7
In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	58.3	41.7	29.0	37.6	32.3
In the past four weeks, did you or any household member have to eat fewer meals in a day because there was not enough food?	41.0	59.0	45.3	28.1	26.6

Question	Response		How often does it happen		
	Yes	no	Rarely	sometimes	Often
	%	%	%	%	%
In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	19.9	78.8	46.9	53.1	0
In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?	7.1	91.7	50.0	41.7	8.3
In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	3.8	95.5	14.3	85.7	0

Sample size (N): Persons With Disabilities = 156 Source Analysis of Field Survey Data, 2017

4.6.1 Categorization of HFIAS Score

The Household Food Insecurity Access Scale (HFIAS) was adapted from the approach used to estimate the annual prevalence of food insecurity in the United States (Coates *et al.*, 2007).

The HFIAS score can be described as a continuous measure of the degree of food insecurity in a household in the past 4 weeks. The HFIAS score was obtained for each household by summing the codes for each frequency-of-occurrence question (Coates *et al.*, 2007).

The maximum score for a household is 27, implying that the household response to all nine frequency-of-occurrence questions was “often”. The minimum score is 0,

which means that the household responded "no" to all occurrence questions. The higher the score, the more food insecurity the household experienced. The lower the score, the less food insecurity a household experienced (Coates *et al.*, 2007).

From table 4.11, 25.5% of disabled farmers can be said to be food secured. This is due to the fact that they scored the least (0.00) in the HFIAS. This category of PWDs is able to feed their households throughout the year without worrying about any incident of food insecurity. This category is followed by PWDs who scored between 1 and 5, who are moderately food secured. This category of disabled farmers is able to mitigate food shortage in their households when it occurs. One farmer in Nambagla community said,

> *"Whenever the food in my house gets finished, I sell my livestock to buy corn for us to feed on".*

The last category of PWDs is those who fall between 5 and 9, who are considered as food insecure. The results show that these PWDs are the majority. They scored the highest on the HFIAS. One disable farmer lamented,

> *"Anytime our corn starts to finish, I worry a lot. I cannot sleep at night because I have no means of getting food when my harvest gets finished. It is only through the help of God and some benevolent people that we are able to survive."*

Table 4.11 Household Food Insecurity and Access Score of PWDs

HFIAS	Frequency	Per cent (%)
0.00	40	25.50
1.00	4	2.60
2.00	4	2.60
3.00	13	8.30
4.00	12	7.70
5.00	33	21.20
6.00	26	16.70
7.00	15	9.60
8.00	5	3.20
9.00	4	2.60
Total	**156**	**100.0**

Source: Analysis of Feld Survey Data, 2017

4.6.2 Cumulative Scores of PWDs on the HFIAS

From Figure 4.6, it is evident that about 43% of disabled farmers surveyed are food insecure. This has to do with the fact that they are unable to get the different varieties of food they require to meet their dietary needs. It is also evident that about 32% of PWDs in the Municipality are moderately food secure. This category of people mostly comprises of people who rear animals. They are able to afford to buy other varieties of food to feed their families.

In addition, only 25% of PWDs are food secure. This category of PWDs is able to feed their families all year round without having to worry about insufficient food.

Food security can be better understood in the context of, physical availability of food, economic and physical access to food, food utilization and stability of the other three dimensions over time (FAO, 2008). In relating these dimension to the food security situation of PWDs in the Municipality, it can be said that, majority of them have challenges with all the dimensions of food security. Firstly, they suffer low yield which makes it difficult for them to have availability of food throughout the year. Secondly, many PWDs in the Municipality do not have other means of earning

income besides farming which makes it difficult for them to purchase food when they suffer food shortage in their households. In addition, PWDs are unable to obtain the required nutrition they need to live a healthy life due to their inability to afford the right varieties of food. This has ultimately resulted in worsening their health status in that, they are more prone to illness. This has further entrenched and enhanced their vulnerability due to the vicious cycle of poverty and food insecurity.

It is worth noting that, the food insecurity situation of the Savelugu-Nanton Municipality stands at 35.2%, and this comprises both moderately and severely food insecure (WFP, 2016). In comparing this statistic to the situation of PWDs, it is evident that, about 75% of PWDs can be said to be food insecure according to the study. This implies that, the food insecurity situation of PWDs is very critical and efforts need to be made to assist PWDs and their households mitigate the negative effects of food insecurity.

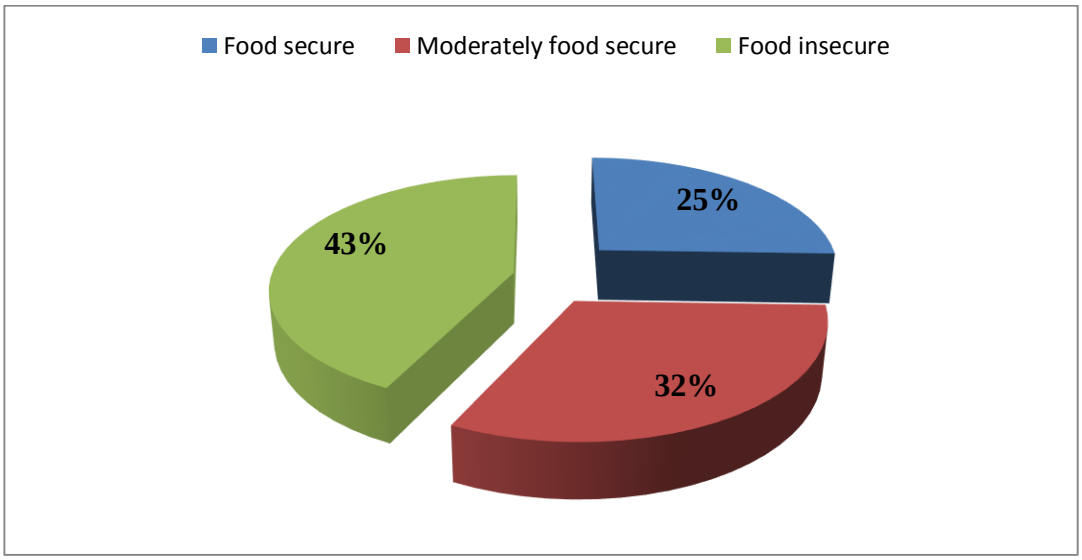


Figure 4.6 Food Security Categorisation based on Access Score (%)
Source: Analysis of Field Survey Data, 2017

4.6.3 Effects of PWDs Participation in Agriculture on Food Security

The nine series of questions on HFIAS which were used in assessing respondents' household food insecurity situation were each coded as '1' if respondents answered 'yes' otherwise '0'. All the responses to the nine questions were summed giving a range of scores of 0 – 9, indicating varying levels of food insecurity. A HFIAS score of zero implies that, the household does not experience any incident of food insecurity and a score of nine means the said household suffered all the nine incidents of food insecurity.

Average HFIAS scores were calculated for each of the three (3) forms of participation of PWDs in agriculture, and Analysis of Variance (ANOVA) was applied to test the hypothesis:

H_O: There is no significant difference in the average scores of HFIAS between the three forms of participation of PWDs in agriculture.

H_1: There is significant difference in the average score of HFIAS between the three forms of participation of PWDs in agriculture.

The result of ANOVA is shown in the Table 4.13, with table 4.12 illustrating the average HFIAS score for the three forms of participation. As shown in the Table 4.13, the ANOVA produced F = 13.252, indicating that there is significant difference in the HFIAS score between the three forms of participation in agriculture by PWDs. This implies that the null hypothesis is rejected.

From table 4.12, it is evident that PWDs who participate in both decision and production activities scored a mean HFIAS of 1.8 (SD = 2.7), while those who participated only in production and marketing decision only scored a mean HFIAS of

2.6 (SD = 2.8) and those who participated in agriculture merely through labour contribution scored a mean HFIAS of 6.2 (SD = 2.0). This implies that disabled farmers who participate in agriculture through decision and production activities are more likely to be food secured. This is evident in the fact that, a disabled person in this category is most likely to be the head of the family. This is followed by PWDs who participate through decision making without participating in physical production activities. Respondents who participated merely through labour contribution were found less likely to be food secured.

Table 4.12 Effects of Participation in Agriculture on Food Security of PWDs

HFIAS	N	Mean HFIAS score	SD	Minimum	Maximum
Participate in production and marketing decision only	31	2.6	2.8	0.0	8.0
Participate in both decision and production activities	78	1.8	2.7	0.0	9.0
Merely participate in agricultural/farming activities but have no power over production decision	47	6.2	2.0	0.0	9.0
Total	156	3.5	2.7	0.0	9.0

Source Analysis of Field Survey Data, 2017

Table 4.13 Result of ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	170.328	2	85.164	13.252	0.000
Within Groups	983.281	153	6.427		
Total	1153.609	155			

Source: Analysis of Field Survey Data, 2017

4.7 Constraints to PWDs Participation in Agriculture in the Municipality

PWDs are considered as the poorest of the poor in many societies (FAO, 2006). All too often, PWDs are destined to endure a life in poverty and are excluded by their societies and their own families from actively contributing to their communities' wellbeing and development. This has a detrimental impact on the food security situation of their households and their own morale and dignity (FAO, 2006).

This section therefore seeks to identify the constraints that PWDs face in their quest to become active participants in agriculture. The challenges PWDs face were ranked from highest to lowest and Kendall's coefficient of concordance was used to rank the constraints.

4.7.1 PWDs Constraints to Participation in Agriculture

Disabled farmers surveyed were asked to list and rank the constraints they faced in engaging in agriculture. The rank scores were subjected to Kendall's coefficient of concordance analysis to examine the level of agreement among the ranked constraints and to identify most severe constraints respondents generally faced. The results of the Kendall's analysis are presented in the Table 4.14.

From table 4.14, the Kendall's rank test revealed that the highest (1^{st}) ranked constraint to PWDs participation in agriculture was the unavailability of agricultural extension officers with a mean rank of 3.76. This can be attributed to the fact that PWDs in the Municipality hardly ever had any contact with agricultural extension officers and this greatly affects their productivity.

The second ranked constraint to PWDs participation in agriculture in the Municipality was societal prejudice, which was ranked 5.69. From the study, it came to light that, the productivity of PWDs was often overlooked due to societal stereotypes and prejudices (Table 4.14).

PWDs are often discriminated against in terms of access to productive resources like credit. This is the concern of one farmer,

> *"Due to my disability, I have not been included in the FBO in my community. People say my farm is not big so I cannot be a member of the association. This has made me unable to access fertilizer and credit to improve my yield."*

The third ranked constraint to PWDs participation in agriculture in the Municipality was low soil fertility which had a mean rank of 6.12. Due to prolonged and continuous use of the land, the nutrient content in the soil has drastically reduced. Many disabled farmers are unable to buy the required amount of fertilizer to ensure good yield. This corroborates the fact that, the primary cause of soil degradation in sub-Saharan Africa is the intensification of agriculture in efforts to feed its growing population especially those who reside in rural areas (Tully, Sullivan, Weil, & Sanchez, 2015).

The fourth ranked constraint to participation was poor access to capital which had a mean rank of 6.31. Many PWDs in the Municipality complained about their inability to mobilize resources to invest in agriculture. PWDs in the Municipality are highly constrained in terms of access to productive resources. Many disabled farmers lamented that, non-disabled farmers were more likely to access productive resources like credit and improved seeds. The situation of disabled farmers in the Savelugu/Nanton Municipality agrees with the assertion that, in most societies in Africa, growing space, land tenure and capital to invest in agriculture such as tools and seeds, may be limited to only persons without disabilities (Leonard Cheshire Disability, 2013, & WHO, 2011). In addition, many disabled farmers in the Municipality rely on labourers to augment their own efforts on the farm.

Due to poverty, they are unable to hire labourers to assist them on their farms. This further worsens their plight and enhances the relationship between poverty and disability.

This agrees with the observation by Groce *et al.*, (2011) that disability is both a cause and consequence of poverty, and poverty and disability reinforce each other, contributing to increased vulnerability and exclusion. In addition, people living with disabilities encounter many disadvantages in society and are often subject to stigma and discrimination.

Marginalized and disproportionately poorer, people living with disabilities are particularly vulnerable to crises and their plight is usually not noticed (Groce *et al*., 2011; Mitra *et al*., 2013; DFID, 2000; & Trani & Loeb, 2012).

The fifth ranked constraint to PWDs participation in agriculture was lack of transportation which had a mean rank of 6.70.

Disabled farmers in the Municipality lamented bitterly about their inability to move to and from the farm easily. The physically impaired find it difficult to work on the farm after they walk long distances to their farms. One farmer lamented,

> *"When I walk to the farm, I find it very difficult to work due to tiredness. If I have a bicycle, my farm work will be greatly improved."*

The sixth and seventh ranked constraints by PWDs were unfavourable weather conditions and insufficient rainfall which had mean ranks of 6.96 and 7.10 respectively. Due to climate variability, farmers in the Municipality suffer from water shortage on their farms. Many farmers complained that rainfall patterns had drastically changed and this affects their yield.

The eighth ranked constraint was bush fire which had a mean rank of 7.30. Many disabled farmers in the Municipality lamented bitterly about their farms being ravaged by bush fires. One disabled farmer said,

> *"Last year, my entire farm was ravaged by bush fire so I lost my entire rice yield".*

The ninth and tenth constraints to participation of PWDs in agriculture are inadequate support from the District Assemblies Common Fund and inadequate farm inputs and equipment which were ranked 7.38 and 8.56 respectively. Municipal and District Assemblies are mandated by law to disburse a 2% allocation of the District Assemblies Common Fund to PWDs (The Constitution, Article 252:2 cited in NCPD/GFD, 2010).

PWDs in the Municipality complained that they hardly received assistance from the Municipal Assembly neither in monitory terms nor in terms of logistics.

In addition, disabled farmers stated that tractor and other services were difficult to access in the Municipality. Many farmers complained that, they were unable to get good yield due to the fact that; they were unable to plough early enough to meet the right time for planting. This is the concern of one farmer,

> *"Last season, I was unable to get a tractor to plough my field early. After I ploughed, heavy rains came and my field became flooded so I could not plant".*

The eleventh ranked constraint to PWDs was the poor health status of farmers which has a mean rank of 8.60. From the study, it came to light that PWDs suffered from various diseases and illnesses which worsens their already bad situation. Almost all the respondents complained of one type of illness or the other which affects their productivity. This seems to go in line with the findings of a study of poverty and

disability in Afghanistan and Zambia which found evidence of lower access to healthcare, education and labour market for People With Disabilities (Trani & Loeb, 2012).

The test statistics (chi square) indicates that the Kendall's coefficient is significant in assessing the level of agreement among respondents' rank scores.

This is due to the fact that, the Chi-square value as shown in the Table 4.14 is significant at 5% level of significance, indicating the rejection of the null hypothesis of no agreement between the respondents. The level of agreement as indicated by the Kendall's coefficient of concordance value of 0.195 is approximately about 19.5%. This indicates that 20% of the rank scores assigned by respondents are in agreement.

Table 4.14 Distribution of Ranked Constraints

Constraints	Mean Rank	Rank
Unavailability of agricultural extension officers	3.76	1st
Societal prejudice	5.69	2nd
Poor access to capital	6.31	4th
Low soil fertility	6.12	3rd
Lack of transportation	6.70	5th
Unfavourable weather	6.96	6th
Insufficient rainfall	7.10	7th
Bush fires	7.30	8th
Inadequate support	7.38	9th
Inadequate farm inputs and equipment	8.56	10th
Poor health status of farmers	8.60	11th
Test Statistics		
N		135
Kendall's W[a]		0.195
Chi-Square		289.36
df		11
Asymp. Sig.		0.000

Source: Analysis of Field Survey Data, 2017

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the major findings of the study, the conclusions drawn on them and recommendations made based on the findings of the study.

5.2 Summary of Major Findings

The major findings of the study are summarised below:

From the study, all PWDs engage in food crop farming. This is followed by livestock rearing, cash crop farming, agro produce marketing and shea nut picking. Agro processing and agro input marketing are the least enterprises engaged in by PWDs in the Municipality. The study also showed all PWDs can engage in agriculture irrespective of their specific type of disability.

The results of the study also showed that agricultural services providers in the Municipality do not consider the specific needs of disabled farmers in their extension service delivery. Disabled farmers are treated the same way as their non-disabled counterparts. Extension field officers in the Municipality lack the capacity and skills to handle agricultural information needs of disabled farmers.

From the study, the Municipal Agricultural Development Unit can be said to be partly disability friendly as the main office building has sliding entrances. The veterinary block however is not disability friendly. The study also showed that, PWDs had little contact with agricultural extension officers hence majority of them relied on friends and relatives for agricultural information.

About a third of the 156 disabled farmers interviewed merely contribute their labour in undertaking their households farming activities of which they play no role in production and marketing decisions. However, the remaining two-third was found to have some level of control over production and marketing decision of their households' agricultural production activities. Those in this category were regarded as participating effectively in agriculture because they have power over production and marketing decision. Age, sex, education, household size, access to labour, membership of FBO, power in household decision making and farm size were significant determinants of disabled farmers' effective participation in agriculture. However, variables such as marital status, type of disability and experience in farming were not significant in determining effective participation of PWDs in agriculture.

The results of the study established a significant link between participation of PWDs in agriculture and their household food security situation. PWDs who have control over decision making are more likely to score higher than PWDs who are exploited. Also, the results showed that, 43% of PWDs in the Municipality are food insecure, 32% are food secure and 25% of PWDs are moderately food secure.

The constraints to PWDs participation in agriculture in the Savelugu-Nanton Municipality in their order of ranking are, the unavailability of agricultural extension officers, societal prejudice, poor access to capital, low soil fertility, lack of transportation, unfavourable weather, insufficient rainfall, bush fires, inadequate support, inadequate farm inputs and equipment and poor health status of farmers.

5.3 Conclusions

The results of the study show that disability does not prevent PWDs from engaging in Agriculture. PWDs are engaged in crop, farming, livestock rearing and shea nut picking.

PWDs have limited access to agricultural extension services. Agricultural services providers in the Municipality do not consider the specific needs of disabled farmers in their extension service delivery. Disabled farmers are treated the same way as their non-disabled counterparts. Extension field officers in the Municipality lack the capacity and skills to handle the agricultural information needs of disabled farmers.

About a third of the 156 disabled farmers interviewed merely contribute their labour in undertaking households farming activities of which they play no role in production and marketing decisions. However, the remaining two-third was found to have some level of control over production and marketing decision of their households' agricultural production activities. Those in this category were regarded as participating effectively in agriculture because they have power over production and marketing decision.

Age, sex, education, household size, access to labour, membership of FBO, power in household decision making and farm size were significant determinants of disabled farmers' effective participation in agriculture. However, variables such as marital status, type of disability and experience in farming were not significant in determining effective participation of PWDs in agriculture.

The study also established a significant link between participation of PWDs in agriculture and their household food security situation. PWDs who participated in agriculture through decision and production activities were more likely to be food

secure whereas PWDs who participated in agriculture merely through labour contribution were more likely to be food insecure.

5.4 Recommendations

In view of the findings, discussions and conclusions, the following recommendations are hereby made;

1. The study recommends the mainstreaming of concerns of PWDs in agriculture in order to ensure an all-inclusive agricultural services provision.
2. Also extension field officers should be trained and equipped with the requisite skills to serve disabled farmers.
3. Effective involvement of PWDs in farmer groupings and provision of credit services should be encouraged to facilitate effective participation of disabled farmers in agriculture.
4. Educational campaigns and advocacy programmes aimed at eliminating stigmatization of disability and removing sociocultural barriers limiting disabled farmers access to land and participation in household decision making should be vigorously embarked upon by the Ministry of Food and Agriculture, National Commission for Civic Education and the non-educational division.
5. The study recommends that the crucial role of disabled farmers to food security needs to be brought to the fore in agricultural planning especially at the rural level. This will ensure that the needs and requirements of disabled farmers will be provided to increase their production capacity to promote their household food security.

6. The study also recommends further study on concerns of PWDs regarding the appropriateness of farm implements which also impede their participation in agriculture.
7. The study recommends further research into the relationship between the participation of PWDs in agriculture and food security. This is a relatively unexplored area which this study brought to light.

REFERENCE LIST

Akpalu, D. A. (2013) *Agriculture Extension Service Delivery in a Semi-Arid Rural Area in South Africa: The Case Study of Thorndale in the Limpopo Province.* African Journal of Food, Agriculture, Nutrition and Development, 13(4).

Al Ju'beh, K. (2015). *Disability Inclusive Development Toolkit.* Retrieved from Bensheim: CBM.: http://www.cbm.org/article/downloads/54741/CBM-DID-TOOLKIT-accessible.pdf.

Ali-Olubandwa, A. M., Kathuri, N. J., & Wesonga, T. E. (2011). Effective extension methods for increased food production in Kakamega District. *Journal of Agricultural Extension and Rural Development, 3*(5), 3(5),95-101.

Amenyah, A. (2005). *The Importance of Learning for Changing Sexual Practices in Response to Hiv/Aids Crisis In Ghana.* University of Georgia.

Awan, H., Khan, N., & Malik, S. (2012). The economic burden of blindness in Pakistan: A socio-economic and policy imperative for poverty reduction strategies. *ndian Journal of Ophthalmology.*, 60(5):358-64.

Badu, E., Agyei-Baffour, P., & Preprah Opoku, M. (2016). Access Barriers to Health Care among People with Disabilities in the Kumasi Metropolis of Ghana. *Canadian Journal of Disability Studies*, 5(2).

Bagbara , T. (2017). *MOFA to Develop a Database System for Agriculture Sector*. Retrieved February 3, 2017, from Ghana.gov.gh. Retrieved: http://www.ghana.gov.gh

Baiphethi, M., & Jacobs, P. (2009). *The contribution of subsistence farming to food security in South Africa. 48(4) 459-482.* Retrieved from Agrekon: http://dx.doi.org/10.1080/03031853.2009.9523836.

Bakhshi , P., Kett, M., & Oliver, K. (2013). *What are the impacts of approaches to increase the accessibility to education for people with a disability across developed and developing countries and what is known about the cost-effectiveness of different approaches?* London: EPPI-Centre, Social Science Research Unit, Institute of Education, Univerity of London.

Ballard, T. J., Kepple, A. W., & Cafiero, C. (2013). *The food insecurity experience scale: developing a global standard for monitoring hunger worldwide.* Retrieved from Technical Paper. Rome, FAO.: http://www.fao.org/economic/ess/ess-fs/voices/en/.

Banks, L.M., & Polack, S. (2013). *The economic costs of exclusion and gains of inclusion of people with disabilities.* London: London School of Hygiene and Tropical Medicine.

Barnes, C., & Mercer, G. (2003). *Disability.* Cammbridge: Polity Press.

Barnes, C., & Mercer, G. (2005). Disability, work, and welfare: challenging the social exclusion of disabled people. *Work, Employment & Society*, 19(3):527-545.

Barron, T., & Amerena, P. (2007). *Disability and Inclusive Development.* (eds. ed). London: Leonard Cheshire International.

Béria, J., Raymann , B., Gigante , L., Figueiredo , A., Jotz, G., Roithman , R., et al. (2007). Hearing impairment and socioeconomic factors: a population-based survey of an urban locality in southern Brazil.Deficiencia auditiva y factores socioeconómicos: estudio de base poblacional en una localidad urbana del sur de Brasil. 21(6):381-7.

Bhanushali, K. (2006). *Dimensions of Disability in India.* Retrieved October 5, 2017, from Disability India Network: http://www.disabilityindia.org.

Brooks, J., Kabir, A. H., Kolgeci, G., Letova, I., Olenik, A., Sali-Terzic, S., et al. (2013). *Strengthening Judicial Integrity Through Enhanced Access to Justice: Analysis of the National Studies on the Capacities of the Judicial Institutions to Address the Needs/Demands of Persons With Disabilities, Minorities and Women.* New York: UNDP.

Bruijin, P. (2014). *Inclusion Works. lessons learned on the inclusion of people with disabilities in a food security project for ultra-poor women in Bangladesh.* Veendendaal, The Netherlands: LIGHT FOR THE WORLD.

Buckup, S. (2009). *The price of exclusion: The economic consequences of excluding people with disabilities from the world of work.* Switzerland: ILO.

Bundy, D., Burbano, C., Grosh, M., Gelli, A., Jukes, M., & Drake, L. (2009). *Rethinking School Feeding: Social Safety Nets, Child Development, and the Education Sector.* Washington D.C., USA: The World Bank.

Burns, N., & Grove, S. K. (2009). *The practice of nursing research: appraisal, synthesis, and generation of evidence.* St. Louis, Mo: Saunders Elsevier.

Carletto, G., K. Covarrubias, and M. Krausova. 2007. Rural Income Generating Activities (RIGA) Study: Income Aggregate Methodology. Rome: Agricultural Sector in Economic Development Service, Food and Agriculture Organization.

Chapman, R., Blench, R., Kranjac-Berisavljevic, G., & Zakariah, A. B. (2003). *Rural radio in agricultural extension: the example of vernacular radio programmes on soil and water conservation in N. Ghana.* AgREN Network Paper.

Coates, J., Swindale, A., & Bilinsky, P. (2007). *Household Food Insecurity Access Scale (HFIAS) for Measurement of Household Food Access: Food and Nutrition Technical Assistance Project, Academy for Educational Development.* (Vol. 3). Washington, D.C: Indicator Guide.

Coe, S. (2012). *More practical lessons from five projects on disability-inclusive development. Development in Practice, 22(3), 400-408.* Retrieved from http://dx.doi.org/10.1080/09614524.2012.664629.

Cuts International. (2011). *Dis-Ability Junction: Where disabilities meet with abilities.* Retrieved from India: Cuts International.: http://www.cuts-international.org/cart/pdf/dis-ability_junction_03-2011.pdf.

Dahl, T.H. (2002). International Classification Of Functioning, Disability And Health: An Introduction and Discussion of its Potential Impact on Rehabilitation Services and Research. *Journal of Rehabilitation Medicine*, 34(5),201-204.

Danso, A. K., Ayarkwa, J., & Dansoh, A. (2011). STATE OF ACCESSIBILITY FOR THE DISABLED IN SELECTED MONUMENTAL PUBLIC BUILDINGS IN ACCRA, GHANA. *The Ghana Surveyor*, 4(1):1-19.

DESA. (2011). *Best practices for including persons with disabilities in all aspects of development efforts.* . New York: UN.

Dewbre, J., & Borot de Battisti, A. (2008). *Agricultural Progress in Cameroon, Ghana and Mali: Why It Happened and How to Sustain It", OECD Food, Agriculture and Fisheries Working Papers, No. 9.* OECD Publishing. doi: 10.1787/241275631215.

DFID. (2000). *Disability, Poverty and Development.* Retrieved from DFID.: http://www.make-development-inclusive.org/docsen/DFIDdisabilityPovertyDev.pdf

Disabled Women's Network. (2007). *Fact sheet: Women with disabilities.* Retrieved March 10, 2016, from http://dawn.thot.net/fact.html.

DISABLED WORLD. (2010). *Definitions of The Models of Disability*. Retrieved 12 19, 2017, from Disabled World: https://www.disabled-world.com/definitions/disability-models.php

Durie, S., & Wilson, L. (2007). *Six Mary's place: social return on investment report.* Edinburgh.

Edge, J. (2013). *Poverty, food insecurity and disability.* Retrieved October 26, 2016, from http://www.new-ag.info/en/focus/focusitem.php?a=3091.

Elifadhili, D. (2013). *Assessment of agricultural extension services in Tanzania. A case study of Kyela, Songea Rural, and Morogoro Rural Districts.* Wageningen.

Elwan, A. (1999). *Poverty and Disability: A survey of the literature.* Washington, DC: Social Protection Advisory Service.

FAO. (2006). *Eighth Session of the Ad Hoc Committee on a Comprehensive and Integral International Convention on Protection and Promotion of the Rights and Dignity of Persons with Disabilities.* New York: New York. FAO.

FAO. (2015). *FAPDA Country Fact Sheet on Food and Agriculture Policy Trends.* Ghana: FAO.

FAO. (2008). *Food Security Information for Action Practical Guides. An Introduction to the Basic Concepts of Food Security, EC - FAO Food Security Programme. FAO.* Retrieved from https://www.foodsec.org/docs/concepts_guide.pdf.

FAO. (2013). *WFP, The State of Food Insecurity in the World 2013. The multiple dimensions of food security.*

Filmer, D. (2008). Disability, poverty, and schooling in developing countries: Results from 14 household surveys. *World Bank Economic Review*, 22(1):141-63.

Fleck, J. (2003). *Accessible London: Achieving an Inclusive Environment. The London Plan (Spatial Dev. Strategy for Greater London) Draft Supplementary Planning Guidance.* London: Greater London Authority.

Frempon-Ntiamoah, E. (2017). *NCPD Develops Standard on Accessibility Designs.* Retrieved March 3, 2017, from Government of Ghana. Ghana.gov.gh: http://www.ghana.gov.gh/index.php/media-center/news/3090-ncpd-develops-standard-on-accessibility-designs

Gauri, V. (2004). Social rights and economics: Claims to health care and education in developing countries. *World Development*, 32(3):465-77.

Gentilini, U., & Omamo , S. (2011). Social protection 2.0: Exploring issues, evidence and debates in a globalizing world. *Food Policy*, 36(3):329-40.

GES. (2004). *The Development of Education, National Report on Ghana. A report presented by the Government of Ghana at the International Conference on Education.*

Ghosh, S. (2012). *Disability Scenario in India With Reference to Livelihood of PWDs – Country Status. National Consultation on Disability & Livelihood – Challenges & Response.* India: SHODHANA CONSULTANCY, PUNE.

GoG. (2017). The Budget Statement and Economic Policy of the Government of Ghana for the 2017 Financial Year presented to Parliament of Ghana. Government of Ghana, Accra.

Groce, N., Kett, M., Lang, R., & Trani, J. F. (2011). *Disability and Poverty: the need for a more nuanced understanding of implications for development policy and practice.* (Vol. 32). Third World Quarterly.

Groce, N. E., Challenger, E., & Kerac, M. (2013). *Stronger Together: Nutrition-Disability Links and Synergies-Briefing Note.*

GSS. (2014). *2010 Population and Housing Census: District Analytical Report. Savelugu-Nanton District.* Ghana: Ghana Statistical Service.

GSS. (2012). *2010 Population and Housing Census: Summary Report of Final Results.* Ghana: Ghana Statistical Service.

Gujarati, D. N. (2004). *Basic Econometrics.* (4th Ed. ed.). New York: Tata Graw – Hill Publishing Co. Ltd.

Gurria, A. (2011). *Divided We Stand: Why Inequality Rising (Speech).* Retrieved October 5, 2017, from OECD: http://www.oecd.org/social/dividedwestandwhyinequalitykeepsrisingspeech.htm.

Hanushek, E., & Wößmann, L. (2007). *The Role of Education Quality in Economic Growth.* World Bank Policy Research Working Paper (4122).

Hirnandani, V., & Sonpal, D. (2010). Disability, Economic Globalization and Privatization: A Case Study of India. *Disability Studies Quarterly*, 30(3/4).

HRW. (2012). *Human Rights for Women and Children with Disabilities.* Retrieved March 26, 2016, from Human Rights Watch: http://www.hrw.org.

Hughes, K., Bellis, M. A., Jones, L., Wood, S., Bates, G., Eckley, L., et al. (2012). Prevalence and risk of violence against adults with disabilities: a systematic review and meta- analysis of observational studies. *The Lancet*, 379(9826), 1621–1629.

HYDE, K. F. (2000). Recognising deductive processes in qualitive research. *Qualitative Market Research: An International Journal*, 3(20),82-89.

ILO. (2007). *EmployAbility: a resource guide on disability for employers in Asia and the Pacific*. Geneva: ILO.

ILO. (2010). *Disability in the Workplace: Company Practices. In: Bureau for Employers' Activities and Skills and Employability Department.* Geneva: ILO.

ILO. (2015). *Key Indicators of the labour Market*. Retrieved September 11, 2017, from ILO: http://www.ilo.org/global/statistics-and-databases/research-and-databases/kilm/WCMS_422402/lang-en/index.htm.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed Methods Research: A Research Paradigm Whose Time Has Come. *Educational Researcher*, 33(7),14-26.

Jost C., 2014. Gender and Inclusion Toolbox: Participatory Research in Climate Change and Agriculture. The CGIAR Research Program on Climate Change Agriculture and Food Security (CCAFS) CARE International World Agroforestry Centre (ICRAF).

Kallet, R. H. (2004). How to Write the Methods Section of a Research Paper. *RESPIRATORY CARE*, 49(10), 1229.

Kalyanpur, M. (2011). Paradigm and paradox: Education for All and the inclusion of children with disabilities in Cambodia. *International Journal of Inclusive Education*, v. 15 (1053-1071).

Kiuppis, F. (2014). Why (not) associate the principle of inclusion with disability? Tracing connections from the start of the 'Salamanca Process'. *International Journal of Inclusive Education*, v. 18 (746-761).

Kendall, M. G., & Smith, B. B. (1939). *The problem of m rankings. The annals of mathematical statistics.* (Vol. 10).

Kett, M., & Twigg, J. (2007). *Disability and disasters: Towards an inclusive approach. In World disasters report – Focus on discrimination.* Retrieved from Geneva: IFRC.: http://www.ifrc.org/PageFiles/99876/2007/WDR2007-English-4.pdf.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3),607-610.

Kumar, R. (2008). *Research Methodology.* APH Publishing Corporation.

Labie, M., Méon, P.-G., Mersland, R., & Szafarz, A. (2010). Discrimination by microcredit officers: Theory and evidence on disability in Uganda. Université Libre de Bruxelles CEB Working Papers. 10-007.

Lamichhane, K. (2013). Disability and barriers to education: evidence from Nepal. *Scandinavian Journal of Disability Research*, 15(4):311-24.

Le Fanu, G. (2014). International development, disability, and education: Towards a capabilities-focused discourse and praxis. *International Journal of Educational Development*, v. 38 (69-79).

Legendre, P. (2010). *Coefficient of Concordance. in: encyclopedia of Research Design.* (NJ Salkind ed. ed., Vol. 1). Sage Publications Inc.

Leonard Cheshire Disability. (2013). *Disability and Urban Agriculture – An innovative approach.* London: Leonard Cheshire Disability and Inclusive Development Centre.

Leymat, A. (2011). *Inclusive employment: how to develop projecs which promote the employment of people with disabilities and other vulnerable populations.*

Liao, J., & Zhao, J. (2013). *Rate of Returns to Education of Persons with Disabilities in Rural China.* Atlantis Press.

MADU. (2017). *CROP PRODUCTION ESTIMATES FOR 2015-2016: SAVELUGU-NANTON MUNICIPAL.* Savelugu-Nanton Municipal Agricultural Development Unit.

Mbo'o-Tchouawou, M., & Colverson, K. (2014). *Increasing access to agricultural extension and advisory services: How effective are new approaches in reaching women farmers in rural areas?* Nairobi, Kenya: International Livestock Research Institute (ILRI).

McFadden, D. (1974). *Conditional logit analysis of qualitative choice behaviour.*

Mensah, O., Williams, J., Atta-Ankomah, R., & Mjomba, M. (2008). *Contextual analysis of the disability situation in Ghana.* Retrieved from Accra: JMK Research Consulting.: http://www.gfdgh.org/Context%20analysis.pdf.

Miles, S., & Singal, N. (2009). The Education for All and inclusive education debate: conflict, contradiction or opportunity? *International Journal of Inclusive Education*, v. 14 (1-15).

Mitra, S. (2006). The Capability Approach and Disability. *Journal of Disability Policy Studies., 16*(4), 236-247.

Mitra, S., Posarac, A., & Vick, B. (2013). *Disability and poverty in developing countries: A multidimensional study.* (Vol. 41). World Development.

Mitra, S., & Sambamoorthi, U. (2014). *Disability prevalence among adults: Estimates for 54 countries and progress toward a global estimate.* Retrieved from Disability and Rehabilitation, 36(11), 940-947.: http://dx.doi.org/10.3109/09638288.2013.825333.

Mizunoya, S., & Mitra, S. (2013). Is There a Disability Gap in Employment Rates in Developing Countries? *World Development*, 42:28-43.

MOFA. (2002). *Agricultural Extension Development Fund (AEDF). Prepared for Directorate of Agricultural Extension Services.* Accra.

MOFA. (2013). *2013 AGRIC SECTOR ANNUAL PROGRESS REPORT.* Accra, Ghana: Ministry of Food and Agriculture.

MOFA. (2016). *AGRICULTURAL SECTOR PROGRESS REPORT 2015.* Accra, Ghana: Ministry of Food and Agriculture.

MOFA. (2010). Medium Term Agriculture Sector Investment Plan II (METASIP II) 2011 – 2015, Ministry of Food and Agriculture, Accra.

MOFA. (2012). Performance of the Agricultural Sector in Ghana: 2006-2012, Gross Domestic Product (GDP) At 2006 Prices by Economic Activity :2006-2012. Ministry of Food and Agriculture, Accra.

MOH/PPME. (2007). *National Health Policy. Creating Wealth through Health.* Retrieved from MOH/PPME: https://s3.amazonaws.com/ndpcstatic/CACHES/PUBLICATIONS/2016/04/16/NATIONAL%2BHEALTH%2BPOLICY.pdf.

MOTI. (2015). *Ghana's Electronic Agriculture: A flagship programme of the World Bank.* Retrieved 10 11, 2017, from MINISTRY OF TRADE AND INDUSTRY: http://www.moti.gov.gh/news/1432890052/ghana's-electronic-agriculture-a-flagship-programme-of-the-world-bank.

Musuruve Inimah, G., Mukulu, E., & Mathooko, P. (2012). Literature Review on Media Portrayal of Peopel with Disabilities in Kenya. *International Journal of Humanities and Social Science, 2(8).*

Myers, M. D. (2009). *Qualitative Research in Business & Management.* London: Sage.

Naami, A. (2010). *The Impact of Unemployment on Women With Physical Disabilities in Tamale, Ghana.* University of Utah.

N'gang'a, V. (2013). *Persons With Disabilities In Agriculture In Kenya: Access To Resources And Training.*

NCPD/GFD. (2010). *Guidelines for the Disbursement and Management of the District Assembly Common Fund Allocation to Persons with Disability.* Retrieved January 4, 2017, from http://ncpwd.go.ke/index.php/cash-transfer-for-pwds.

NDP. (2000). *Ghana National Disability Policy Document.* Ministry of Employment and Social Welfare, Delaram.

New Agriculturist. (2013, September 26). *Focus on Agriculture and disability*. Retrieved October 10, 2016, from The New Agriculturist Web site: http://www.new-ag.info/en/focus/on.php?a=3087

Ogalleh, S., Vogl, C., Eitzinger, J., & Hauser, M. (2012). *Local Perceptions and Responses to Climate Change and Variability: The Case of Laikipia District, Kenya.* Retrieved from Sustainability, 4(12), 3302-3325.: http://dx.doi.org/10.3390/su4123302.

O'Reilly, A. (2007). *The right to decent work of persons with disabilities.* (ILO, Geneva).

Osborn, D., Cutter, A., & Ullah, F. (2015). *UNIVERSAL SUSTAINABLE DEVELOPMENT GOALS: Understanding the Transformational Challenge for Developed Countries.* Stakeholder Forum.

Polit, D. F., Hungler, B. P., & Beck, C. T. (2001). *Essenials of nursing research: methods, appraisal and utilization.* Philadelphia: Lippincott.

Qamar, M. K., & Shahbazi, I. (2003). *Addressing Extension and Training Needs of Persons With Physical Disabilities: A case study of the Islamic Republic of Iran.* Rome: FAO.

Rencher, A. C. (2002). *Methods of Multivariate Analysis.* New York: John Wiley & Sons.

Rimmerman, A. (2013). *Social inclusion of people with disabilities: National and international perspectives.* CUP.

Rohwerder, B. (2015). *Disability inclusion: Topic guide.* Birmingham, UK: GSDRC, University of Birmingham.

Russo, H. (2003). *Education for All: A Gender and Disability Perspective.* Washington D.C.: World Bank.

Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for Business Students.* Harlow: Pearson Education.

Schulze, M. (2010). *Understanding the UN convention on the rights of persons with disabilities.* Retrieved from Handicap International.: http://www.hiproweb.org/uploads/tx_hidrtdocs/HICRPDManual2010.pdf.

Scope. (2017). *The social model of disability: What is it and why is it important?* Retrieved 12 19, 2017, from SCope: http://www.scope.org.uk/about-us/our-brand/social-model-of-disability

Senses Australia. (2016). *About Deafblindness; Sensory Impairment*. Retrieved March 14, 2016, from Deafblind Information by Senses Australia: http://www.deafblindinformation.org.au/about-deafblindness/sensory-impairment/.

Shevlin, M., Kenny, M., & McNeela, E. (2002). Curriculum Access for pupils with Disabilities: An Irish Experience. *Disability and Society*, 17(2):159-169.

Somekh, B., & Lewin, C. (2005). Research methods in the social sciences. *Sage*.

SNMA. (2015). *Ghana: Municipal Profile of Savelugu-Nanton Municipality. 2015.*

Stiglitz, J. E. (2012). *The Price of Inequality: How Today's Divided Society Endangers Our Future.* Norton: Kindle Edition.

Terzi, L. (2004). The social model of disability: a philosophical critique. *Journal of applied philosophy, 21*(2), 141-157.

Thornicroft , G., Brohan, E., Rose, D., Sartorius, N., & Leese, M. (2009). Global pattern of experienced and anticipated discrimination against people with schizophrenia: a cross-sectional survey. *The Lancet*, 373(9661):408-15.

Trani, J. F., & Loeb, M. (2012). Poverty and disability: a vicious circle? Evidence from Afghanistan and Zambia. *Journal of International Development, 24*(S1), S19–S52.

Tully, K., Sullivan, C., Weil, R., & Sanchez, P. (2015). *The state of soil degradation in sub-Saharan Africa: Baselines, trajectories, and solutions. Sustainability.* (Vol. 7).

Turmusani, M. (2003). *Disabled People and Economic Needs in the Developing World: A Political Perspective from Jordan.* Hampshire: Ashgate Publishing Limited.

UNCRDP. (2006). *Convention on the Rights of Persons With Disabilities and Optional Protocol. New York: UN.* Retrieved from http://www.un.org/disabilities/documents/convention/convoptprot-e.pdf.

UNDP. (2007). *Ghana human development report. Towards a more inclusive society. Ghana: UNDP.* UNDP. (2007). *THE GHANA HUMAN DEVELOPMENT REPORT.* Accra, Ghana: UNDP. Retrieved from http://hdr.undp.org/sites/default/files/nhdr_2007_ghana.pdf.

UNDP. (1995). *UNDP Human Development Report: Valuing women's health.*

UNESCO. (2015). *Monitoring of the Implementation of the Convention and Recommendation against Discrimination in Education (8th Consultation) The*

Right to Education forPersons with Disabilities. Paris, France: United Nations Educational, Scientifi c and Cultural Organization.

UNESCO. (2009). *Towards inclusive education for children with disabilities: A guideline.* Bangkok: UNESCO, Bangkok.

UN Enable. (2007). *Employment of persons with disabilities.*

UNICEF. (2013). *The state of the world's children 2013: Children with disabilities.* New York.

UNICEF, WHO, & The World Bank. (2014a). *Levels and Trends in Child Malnutrition*. Retrieved December 23, 2017, from http://www.who.int/nutgrowthdb/estimates2013/en/

US LEGAL. (2016). *Physically impaired Law and Legal Definition*. Retrieved March 11, 2016, from US Legal: https://definitions.uslegal.com/p/physically-impaired/.

Venkatesh, V., Brown, S. A., & Bala, H. (2013). Bridging the qualitative-quantitative divide: Guidelines for conducting mixed methods research in information systems. *MIS quarterly*, 37(1).

Walker, J. (2017). *EQUAL RIGHT EQUAL OPPORTUNITY: Inclusive Education for Children With Disabilities.* Johannesburg, South Africa: GLOBAL CAMPAIGN FOR EDUCATION.

Wapling, L., & Downie, B. (2012). *Beyond charity: a donor's guide to inclusion – Disability funding in the era of the UN Convention on the Rights of Persons with Disabilities.* Retrieved from Boston: Disability Rights Fund.: http://www.disabilityrightsfund.org/files/beyond_charity._a_donors_guide_to_inclusion.pdf.

WFP. (2016). *Emergency Food Security and Market Assessment in Ghana.* WFP.

WHO. (2001). *International Classification of Functioning, Disability and Health: ICF*. WHO.

WHO. (2011). *World report on disability. Geneva: WHO*. Retrieved from http://www.who.int/disabilities/world_report/2011/report.pdf.

Worth, S. (2008). Developing curriculum markers for agricultural extension education in South Africa. *Journal of Agricultural Education and Extension.*, 14 (1): 21-34.

Yeo, R., & Moore, K. (2003). Including disabled people in poverty reduction work: "Nothing about us', without us" *World Development*, 31(3):571-90.

Zakaria H., 2016. The drivers of women farmers' participation in cash crop production: the case of women smallholder farmers in Northern Ghana, The Journal of Agricultural Education and Extension.

Zwiefelhofer, D. B. (2008). *Savelugu-Nanton ghana*. Retrieved 3 24, 2018, from Find Latitude and Longitude: http://www.findlatitudeandlongitude.com/?loc=Savelugu-Nanton+ghana&id=1686023#.WrjXLIDLfqA

APPENDICE 1: QUESTIONNAIRE FOR PWDs

QUESTIONNAIRE FOR PERSONS WITH DISABILITIES ON THEIR PARTICIPATION IN AGRICULTURE

ANALYSIS OF PERSONS WITH DISABILITIES' PARTICIPATION IN AGRICULTURE AND ITS EFFECTS ON FOOD SECURITY SITUATION OF PWDs IN THE SAVELUGU/NANTON MUNICIPALITY

DEPARTMENT OF AGRICULTURAL EXTENSION, RURAL DEVELOPMENT AND GENDER STUDIES

FACULTY OF AGRICUSINESS AND COMMUNICATION SCIENCES

UNIVERSITY FOR DEVELOPMENT STUDIES

Questionnaire No …… Date…….....…. Interviewer NAME ……

Zone …… Community……

Introduction

This information is being sought from you as part of a research 'Analysis of Persons With Disabilities' participation in agriculture and its effects on food security situation of PWDs in the Savelugu/Nanton Municipality'. This study is in partial fulfilment of an award of Mphil in Innovation Communication from the department of Agricultural Extension, Rural Development and Gender studies. For each question, write the code number corresponding to the response in the right column next to that question. Your answers are confidential.

	Section 1: Personal Information		
No	**QUESTIONS AND FILTERS**	**CODING CATEGORIES**	**SKIP**
1.1	SEX	Male ……..…. (1) Female ……..…..(2)	
1.2	How old are you?	<25 years ……...…….(1) 25 – 35 years ……..…….(2) 36 – 45 years ……..……(3) 46 – 60 years …..…….(4) > 6o years ……..……..(5)	
1.3a	What level of formal schooling have you completed?	No formal education .....(1) Basic Level ……..…(2)	

		Secondary level ……..….(3) Tertiary Level ……..…(4)	
1.3b	Can you read and/or write English?	Yes ……..(1) No ……(2)	
1.4	Marital Status	Married …..……(1) Single ……..……(2) Divorced …….(3) Windowed ……...(4) Separated ……..(5)	
1.5a	Type of disability	Physical disability ……(1) Sensory disability ……(2) Both ……..(3)	
1.5a	Specific disability	Hearing impairment …….. (1) Visual impairment ……(2) Limb/arm impairment ……(3) Autism……(4) Others (specify)	
1.6a	Household Size ……		
1.6b	Household age structure (fill in the table indicating the number of males and females by their sex)		
1.7	What is/are your main occupation(s)?	Salary worker ……..(1) Farmer ……(2) Trader ……..(3) Artisan ……(4) Other (specify)…….. NB: Multiple choices possible	

	> 15 years	15 – 65 years	65+ years	
Male				
Female				
Total				

1.7	What is the main source of your income?	Salary work... ……..(1) Farming…...…….(2) Trading……..……..(3) Artisanship…..…….(4) Begging ……(5) Other (specify)……..	
1.8a	In your own estimation, how secure is your main source of income?	Very Secure …….(1) Somehow secure ...……..(2) Not secure at all ……..(3)	If option 1, skip to 1.9
1.8b	Why do you think your main source of income is not secure? …….. …… ……..		
1.9	What is your annual income?	>732gh ……(1) 732 – 1, 464 …….(2) Above 1, 464 …….(3)	
1.10a	Do you belong to any Farmer Based Organization?	Yes ……..(1) No ……(2)	If yes, skip to 1.10c
1.10b	If no, why? …… …… …… ……		
1.10c	If yes, do you hold any leadership position in the FBO?	Yes ……..(1) No ……(2)	If no, skip to the next section

1.10d	If yes to question 1.10c, which position? ……		
	Section 2: Agricultural Activities		
2.1a	Do you engage/participate in agriculture?	Yes ……..(1) No ……(2)	
2.1b	If yes to question 2.1a, how do you participate in agriculture?	Participate in decision making on agricultural production ……..(1) Participate in both agricultural/farming activities and production decision ……(2) Merely participate in agricultural/farming activities but have no power over production decision ……(3)	
2.2	What agricultural enterprise(s) do you engage in?	Food Crop production ……..(1) Cash Crop production ……..(2) Livestock rearing ……..(3 Agro processing ……(4) Agro produce marketing..…..(5) Agro input marketing …… (6) Others (specify) …… **Multiple choose allow**	

2.3 Please list the type of crops you have been growing over the years?[1]

S/N	Type of crops grown	Source of land[2]	Farm size (ha)	Output (last season) (bags)	Experience in growing the crop (years)
1	Maize				

[1] also ask for the farm size and output last season for each crop, and the experience in growing it

[2] Family land = 1; own land = 2; communal land = 3; purchase/leased = 4; shared cropping = 5 others (specify) ……..

	2	Rice					
	3	Sorghum/Millet					
	4	Groundnut					
	5	Soybean					
	6	Cowpea					
	7						
	8						
	9						
	10						

2.4 Please list the type of livestock you keep?[3]

S/N	Livestock kept	Current stock number	Income from sale of livestock	Experience in keeping (years)	
1	Goat				
2	Sheep				
3	Cattle				
4	Pig				
5	Fowl				
6	Guinea fowl				
7					
8					
9					
10					

2.5	Which agro processing activity do you engage in?	Shea butter processing …….. (1) Groundnut oil processing …..(2) Others (specify)……..	
2.6	Which agro marketing activity do you engage in?	Cereals/Grains …….. (1) Roots and Tubers …… (2) Livestock …….. (3)	

[3] also ask for the current stock and income received from the sale of livestock within the last year, and the experience in rearing livestock

		Input marketing …….. (4) Others (specify) ……..	
	Section 3: Access to Agricultural Services and inputs by PWDs		
3.1a	Where do you usually get your agricultural information from?	MOFA extension officers ……(1) NGOs extension officers …….(2) Colleague/friends/relatives …..(3) Radio/mass media ……(4) Others (specify) …… **NB: Multiple choice possible**	
3.1b	Which of the sources of agricultural information is your main source of information?	MOFA extension officers ……(1) NGOs extension officers …….(2) Colleague/friends/relatives …..(3) Radio/mass media ……(4) Others (specify) ……	
3.1c	What type of information do you receive from the source?	Crop varietal information ……(1) Planting/land preparation …….(2) Weed control information ……(3) Disease prevention ……..(4) Harvesting and postharvest ….(5) Marketing information …….(6) Livestock production ……. (7) Others (specify) …….. **NB: Multiple choice possible**	
3.2a	How will you describe your access to agricultural information?	Very accessible ……(1) Somehow accessible ……(2) Not accessible at all ……(3)	
3.2b	Please explain your rank in question 3.2a. …… …… …… …… ……		

3.3a	How many extension visits did you receive from extension officers last season? ……..		
3.3b	Do you feel welcomed by extension officers and/or MOFA/NGOs officers/officials?	Yes ……..(1) No ……(2)	If yes, Skip to 3.4
3.3c	If no why? (probe for more explanation) …… …… …… ……		
3.4	How many veterinary officer visits did you receive from extension officers last season? ……..		
3.5a	Are you satisfied with the extension service delivered to you?	Yes ……..(1) No ……(2)	If yes, skip to 3.6a
3.5b	If no, why? (Explain) …… …… …… ……..		
3.6a	Have you ever participated in agricultural activities organized by MOFA and/or NGOs?	Yes ……..(1) No ……(2)	If no, skip to 3.7
3.6b	If yes to question 3.5a, what activity (ies)? (Mention and explain) …….. …… ……		

	……		
3.7a	Have you ever taken credit to invest in your agricultural enterprise?	Yes ……..(1) No ……(2)	If no, skip to 3.7d
3.7b	If yes to question 3.7a, where did you borrow from?	Bank ……..……..(1) NGO ……..……..(2) MFIs ……(3) Friends/relatives ……(4) Money lenders ……(5) Other (specify) ……	
3.7c	If yes to question 3.7a, What form of credit did you take?	Financial (money) ……(1) Input credit …..……(2) Others (specify) ……	
3.7d	If no to question 3.7a, why? (Explain) …… …… …… …… ……..		
3.8a	How will you describe your access to land?	Very accessible ……..(1) Somewhat accessible …….(2) Less accessible ……..(3) Not accessible at all ……..(4)	
3.8b	Explain your rank in question 3.8a …….. …… …… …… ……..		

	…… ……		
3.9a	How will you describe your access to labour?	Very accessible ……..(1) Somewhat accessible …….(2) Less accessible ……..(3) Not accessible at all ……..(4)	
3.9b	Explain your rank in question 3.9a …….. …… …… …… …….. …… ……..		
3.10a	How will you describe your access to agro-chemicals?	Very accessible ……..(1) Somewhat accessible …….(2) Less accessible ……..(3) Not accessible at all ……..(4)	
3.10b	Explain your rank in question 3.10a …… …….. …… …… …… …….. …… ……..		
3.11	Please list rank the challenges you face in accessing agricultural services		

s/n	Challenges in accessing agricultural services	Rank	

3.11b How do you think these limitations/challenges mentioned in question 3.11a can be solved?

s/n	Challenges in accessing agricultural services	Possible solutions	

Section: Household Food Security

4.1a	What is/are sources of your household food?	HH farm…….. . (1) Purchased from market …….(2) Food aid/begging ……..(3) Friends/relatives ……..……(4) Others (specify) …… **NB: Multiple choice allowed**	
4.1b	Which of the sources is the main source of food for your household?	HH farm…….. . (1) Purchased from market …….(2) Food aid/begging ……..(3) Friends/relatives ……..……(4) Others (specify) ……	
4.1c	How secured is your household food security situation?	Very secured ……(1) Somewhat secured ……..(2) Less secured ……(3)	

		Not secured at all ……(4)	
	Household Food Insecurity Access Scale (HFIAS) Measurement Tool		
4.2a	In the past four weeks, did you worry that your household would not have enough food?	Yes ……..(1) No ……(2)	If no, skip to 4.3a
4.2a	How often did this happen?	Rarely (once or twice in the past four weeks) ……. (1) Sometimes (three to ten times in the past four weeks) ……..(2) Often (more than ten times in the past four weeks)……..(3)	
4.3a	In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	Yes ……..(1) No ……(2)	If no, skip to 4.4a
4.3b	How often did this happen?	Rarely (once or twice in the past four weeks) ……. (1) Sometimes (three to ten times in the past four weeks) ……..(2) Often (more than ten times in the past four weeks)……..(3)	
4.4a	In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources?	Yes ……..(1) No ……(2)	If no, skip to 4.5a
4.4b	How often did this happen?	Rarely (once or twice in the past four weeks) ……. (1) Sometimes (three to ten times in the past four weeks) ……..(2) Often (more than ten times in the	

		past four weeks)……..(3)	
4.5a	In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain food?	Yes ……..(1) No ……(2)	If no, skip to 4.6a
4.5b	How often did this happen?	Rarely (once or twice in the past four weeks) ……. (1) Sometimes (three to ten times in the past four weeks) ……..(2) Often (more than ten times in the past four weeks)……..(3)	
4.6a	In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	Yes ……..(1) No ……(2)	If no, skip to 4.7a
4.6b	How often did this happen?	Rarely (once or twice in the past four weeks) ……. (1) Sometimes (three to ten times in the past four weeks) ……..(2) Often (more than ten times in the past four weeks)……..(3)	
4.7a	In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?	Yes ……..(1) No ……(2)	If no, skip to 4.8a
4.7b	How often did this happen?	Rarely (once or twice in the past four weeks) ……. (1) Sometimes (three to ten times in the past four weeks) ……..(2) Often (more than ten times in the	

		past four weeks)……..(3)	
4.8a	In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	Yes ……..(1) No ……(2)	If no, skip to 4.9a
4.8b	How often did this happen?	Rarely (once or twice in the past four weeks) ……. (1) Sometimes (three to ten times in the past four weeks) ……..(2) Often (more than ten times in the past four weeks)……..(3)	
4.9a	In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?	Yes ……..(1) No ……(2)	If no, skip to 4.10a
4.9b	How often did this happen?	Rarely (once or twice in the past four weeks) ……. (1) Sometimes (three to ten times in the past four weeks) ……..(2) Often (more than ten times in the past four weeks)……..(3)	
4.10a	In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	Yes ……..(1) No ……(2)	
4.10b	How often did this happen?	Rarely (once or twice in the past four weeks) ……. (1) Sometimes (three to ten times in the past four weeks) ……..(2) Often (more than ten times in the past four weeks)……..(3)	

4.11 What do you do to mitigate food shortage in your household when it occurs?

……

……

……

……

4.12a Please list rank the challenges you face in ensuring your household's food security

s/n	Challenges in ensuring household food security	Rank

4.12b How do you think these challenges mentioned in question 4.12a can be solved?

s/n	Challenges in ensuring household food security	Possible solutions

4.13a Please list rank the challenges/limitations you face in participating actively in agriculture

s/n	Challenges to active participation in agriculture	Rank

4.13b	How do you think these limitations/challenges can be solved?			
	s/n	Challenges to active participation in agriculture	Possible solutions	

APPENDICE 2: QUESTIONNAIRE FOR EXTENSION OFFICERS

UNIVERSITY FOR DEVELOPMENT STUDIES

FACULTY OF AGRICUSINESS AND COMMUNICATION SCIENCES

DEPARTMENT OF AGRICULTURAL EXTENSION, RURAL DEVELOPMENT AND GENDER STUDIES

Questionnaire No …… Date……..…. Interviewer NAME ……

Zone …… Community ……..

Introduction

This information is being sought from you as part of a research 'Analysis of persons with disabilities' participation in agriculture and its effects on food security situation of PWDs in the Savelugu/Nanton Municipality'. This study is in partial fulfilment of an award of MPhil in Innovation Communication from the Department of Agricultural Extension, Rural Development and Gender studies. For each question, write the code number corresponding to the response in the right column next to that question. Your answers are confidential.

Inclusion of the concerns of PWDs in agricultural service delivery my MOFA staff

1.1. Which agricultural services do you offer?

……

……

……

1.2.a. How do you offer agricultural services?

……

……
……

1.2.b. Have you been trained to offer extension services to PWDs?

……

1.3a. Do you offer agricultural services to PWDs?

……...

1.3b. If No, please explain why

……
……
……

1.3c. How do you offer agricultural services to PWDs?

……
……
……
……

1.4.a. Do you have a contact farmer who is a PWD?

……

1.4.b. Do you have a FBO in your area?

……...

1.4.c. Are PWDs allowed to be part of the group?

……...

1.4.d. If No please explain why

……
……
……
……

1.4.d. What steps do you put in place to ensure that PWDs actively participate in group activities?

……
……
……
……

1.5.a. How will you describe your level of inclusion of PWDs in your service delivery? (Probe)

……
……
……
……

1.6.a. How many extension visits did you conduct for PWDs last season?

…….....

1.6.b. How many veterinary visits did you conduct for PWDs last season?

……

1.7.a. Do you assist PWDs access credit?

……

1.7.b. Where do you access the credit?

……

1.8.a. Please list rank the challenges you face in your service delivery to PWDs

……
……
……
……
……
……
……
……
…

1.8.b. How do you think these limitations/challenges mentioned in question 1.8a can be solved?

……
……
……
……
……

1.9.a. Do you include PWDs in your planning and programming activities?

……

1.9.b. If No please explain why?

……
……
……

Thank you!!!!!!!!!

APPENDICE 3: OBSERVATIONAL CHECKLIST FOR FOCUS GROUP DISCUSSIONS

Observational Checklist for Focus Group Discussions

1. Is the municipal agricultural office disability accessible?
2. Are the staff welcoming?
3. How effective are their activities?
4. Do they have a car?
5. Do they have motorbikes for field work?
6. Do they get allowances for fuel?
7. What provisions do they make for PWDs who are deaf and need sign language interpretation?
8. Are disabled farmers able to use farm tools efficiently?