

An Investigation into Household Food and Nutrition Security in Zambia: A Case of Rural Areas in Chasefu District Found in Eastern Province.

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ABSTRACT:

The study investigated factors influencing the household Food and Nutrition security in Zambia. Food and nutrition security existed when all people at all times had physical, social and economic access to food, which was consumed in sufficient quantity and quality to meet their dietary needs and food preferences. That was needed to be supported by an environment of adequate sanitation, health services and care. The study was guided by the following research objective; to assess the availability of household food and nutrition, to investigate the household access to food and nutrition, to establish the utilization of the household food and nutrition and to identify locally resilient food sources for household food and nutrition. Descriptive research design guided this study that had an estimated population of 680 people; household heads, traditional local leadership, civic leaders, non-governmental organization workers and Agriculture extension workers, out of the estimated population, 80 people were drawn by use of purposive sampling method. The data was coded and analyzed using Excel and Statistical Package for Social Sciences version twenty-five (SPSS V25). The findings were that the households in rural areas had above five (5) household member representations that demanded enough and steady availability, access and utilization of food and nutrition. There were no expanded use of improved inputs and practices in food production, no additional investments in rural infrastructure, including in harvest technologies. Farmers did not integrate sustainable practices, in particular in the use of natural resources. All people at all times had no physical, social and economic access to food that was consumed in sufficient quantity and quality because of the inability to generate sufficient income as well as not having women access to production. There were no information campaigns and educational programmes designed to improve health, water and sanitation services. Irrigation programme to improve productivity levels and boost crop yields for resilient food sources that contributed to food and nutrition security were absent. Pawpaw was identified an indigenous crop regarded resilient food source for food and nutrition security.

KEY WORDS: *Availability, Access, Utilization, Resilience, Household, Food and Nutrition Security, Malnutrition, Health, Pawpaw.*

I. INTRODUCTION

According to FAO, (2018) Food and nutrition security exists when all people at all times had physical, social and economic access to food, which was consumed in sufficient quantity and quality to meet their dietary needs and food preferences, and was supported by an environment of adequate sanitation, health services and care, allowing for a healthy and active life. Thus, Food and Nutrition security depended on having access to a healthy diet that provided all nutrients required for a health life and being healthy so that the body made optimal use of these nutrients for its different function (Holben, 2010). Food was necessary to maintain an optimal nutritional status, and core to its definition was the requirement for nutritious food, that referred not only to sufficient quantities of food in terms of calories, but also to sufficient quality in terms of variety and micronutrient content (UNICEF, 2018). These therefore display an integral linkage between food security, on one hand, and nutrition security on the other hand. The two combined meant having reliable access to food in sufficient quantity and quality and to enjoy a healthy and active life coupled with a sanitary environment.

To be food and nutrition secure, people must also be free of repeated chronic or acute infections, that interfered with the absorption and utilization of food and nutrients for the body functions (FAO, IFAD, UNICEF, WFP and WHO, 2018). Food and Nutrition security allowed for appropriate utilization of food and nutrients by the body to create the conditions for a healthy and active life.

Food and nutrition security worldwide was recognized as a human right and a critical ingredient for economic, social and human development (Black, R.E. et al. 2013). However, Food insecurity and undernourishment were on the rise worldwide, from

an estimated 777 million people in 2015 to 815 million people in 2019 (Mason, et al 2015). That increase was a global concern in achieving the second sustainable development goal, which calls for a commitment to end hunger, reduce food insecurity, and improve nutrition by 2030. The majority of food-insecure populations resided in Africa that was home to the largest number of the poorest and most poverty-stricken countries in the world.

Zambia was not spared, as the Global Hunger Index report (GHI) ranked Zambia under the category of alarming levels of hunger (GRZ, 2006). In Zambia, ensuring adequate nutrition especially among the low-income groups, mothers and children, and the vulnerable populations was a serious challenge (GRZ, 2006). Currently, 45% of the children under-five years of age were chronically under-nourished (stunted). That represented about 1.2 million children within the same age-group who were stunted while further close to 160,000 were wasted. In addition, close to 52,000 babies were born with low birth weight. Further, every year at least one in two children died as a result of under-nutrition (Central Statistical Office [CSO], 2014) a condition that was preventable caused lifelong disadvantages impacting negatively on intellectual and physical development and health outcomes for children.

The Government of the Republic of Zambia was aware that levels of under-nutrition in the country had remained consistently high. In addressing the challenge, the National Food and Nutrition Policy was an outcome of a series of national discussions facilitated by the National Food and Nutrition Commission based on Zambia's experiences (GRZ, 2006). The Policy was developed as a result of the long-standing food and nutrition insecurity that affected the majority of the Zambian population; a situation that had been exacerbated by unfavorable

climatic conditions in many parts of the country in recent years. Coordinated concerted efforts from different actors and stakeholders invested significantly in better household food and nutrition security.

In 2011 through the Ministry of agriculture and in response to the National Food and Nutrition Policy (NFNP), the National Food and Nutrition Commission and operating together with partners provided leadership in developing the National Food and Nutrition Strategic Plan for Zambia 2011-2015 (GRZ, 2011). The plan covered eleven key strategic directions related to improving food and nutrition security in the country (GRZ, 2011). The plan gave a major priority to new multi sector, synergistic efforts to strengthen and expand interventions related to and promote health and productivity to Zambian families in particular and the productivity of the national food and nutritional security (GRZ, 2011). Government was thus committed in galvanizing political leadership at high-levels to move forward this strategy so those nutritional outcomes were properly enshrined as key goals of national development policies and plans.

The government scaled up effective, evidence-based actions in the country that quickly reduced at household, especially among young children and their mothers. Among the priorities of Zambia as a member country of the Scaling Up Nutrition (SUN) movement, were support for effective leadership and adoption of a broad, multi-sectoral approach to implementation of key interventions at all levels (Black, R.E. et al. 2013). Investment in food and nutrition was non-negotiable because it was crucial in achieving the United Nations Millennium Development Goals including eradicating poverty and hunger, reducing child mortality, improving maternal health, combating disease, empowering women, and achieving universal primary education

through a food and nutrition secure country (GRZ, 2011).

The Fifth and Sixth National Development Plans included explicitly food and nutrition components aimed at Food and Nutrition Security at household level towards the nutrition improvement of the country's Vision2030 (Martin, 2014)

The National Agricultural Policy (NAP) covering the years 2004-2015 was recently revised to focus on building a competitive, value-added export led agricultural sector that promoted Food and Nutrition Security for the country (Martin, 2014). The revised NAP aimed at achieving “An efficient, dynamic, competitive, sustainable and value-added export led agricultural sector that enhanced income, food and nutrition security for vulnerable rural households while ensuring the competitiveness of the agriculture industry in the region” (Martin, 2014: 6).

Subsequently, the current Government of Zambia launched the preparation of the National Agricultural Investment Plan (NAIP) in July 2012 and released a draft copy in March, 2013. The NAIP was a road map for agriculture and rural development that identified priority areas for investment and estimated the financing needs to be provided by the Government and its development partners aimed at improving household food and nutrition security and anchored to, and aligned with, the national vision of becoming a middle-income country by 2030 (GRZ, 2011).

According to Martin, (2014: 6) the NAIP process focused on the need to realign policy and increase budget allocations to production, productivity and commercialization initiatives and redirecting funding away from low return subsidy programs but agriculture, particularly in terms of Food and Reserve Agency's (FRA) buying and selling practices and regulations over cross border trade”.

That was the most salient factor in Food and Nutrition Security at household level in Zambia.

Improved crop varieties had been the target of the Zambian government in which locally available hybrid maize varieties had the potential for yields 4 times greater than the current average for small farmers (Siamusantu, 2017).

Despite all governments' policies, strategies and directives aimed at promoting household Food and Nutrition Security, an estimated 868 million people in the world did not have access to sufficient calories while over 2 billion people were micronutrient deficient (FAO 2012). Iron, vitamin A, iodine and zinc were the micronutrients most commonly deficient in diets around the world. Over 250 million children were estimated to have vitamin A deficiency (WHO 2012) that caused up to 500,000 children to go blind each year. Fruit and vegetable availability and intake were well below World Health Organization (WHO) recommendations globally that had been linked to 2.7 million deaths per year and associated to the risks of heart disease and stroke as well as risk of type 2 diabetes mellitus (Yach et al. 2006). There was now over 1.4 billion over-weight or obese people in the world including developing countries like Zambia that had not yet overcome under-nutrition (FAO 2012).

In the rural areas of Chasefu district, there had been a continuous increase of Food and Nutrition Insecurity every year. That had led to the area in becoming a regular food aid recipient from the National Food Reserves Agency (NRFA). Although food and nutrition security policy development and multi-sectoral awareness had been carried out, households' food and nutrition insecurity still prevail in Chasefu district. That was evident from the

malnutrition statistic as recorded by the Food and Nutrition Section from the four randomly selected Rural Health Centers in Chasefu District for the period of three years from 2017 to 2019.

Table 1.1: Malnutrition statistic for children under-five from 4 randomly selected RHC in Chasefu district for the period of 3years from 2017 to 2019.

	2017		2018		2019	
	Mild	Acute	Mild	Acute	Mild	Acute
Egichiken Rural Health Centre	212	199	278	243	323	214
Kamzooole Rural Health Centre	400	334	419	367	494	312
Mthwalo Rural Health Centre	109	98	219	230	300	129
Kanyanga Mission Hospital	444	376	528	409	233	343
Phikamalaza Rural Health Centre	119	284	329	312	389	347

Source: District Health Management Office/Nutritionist, 2020.

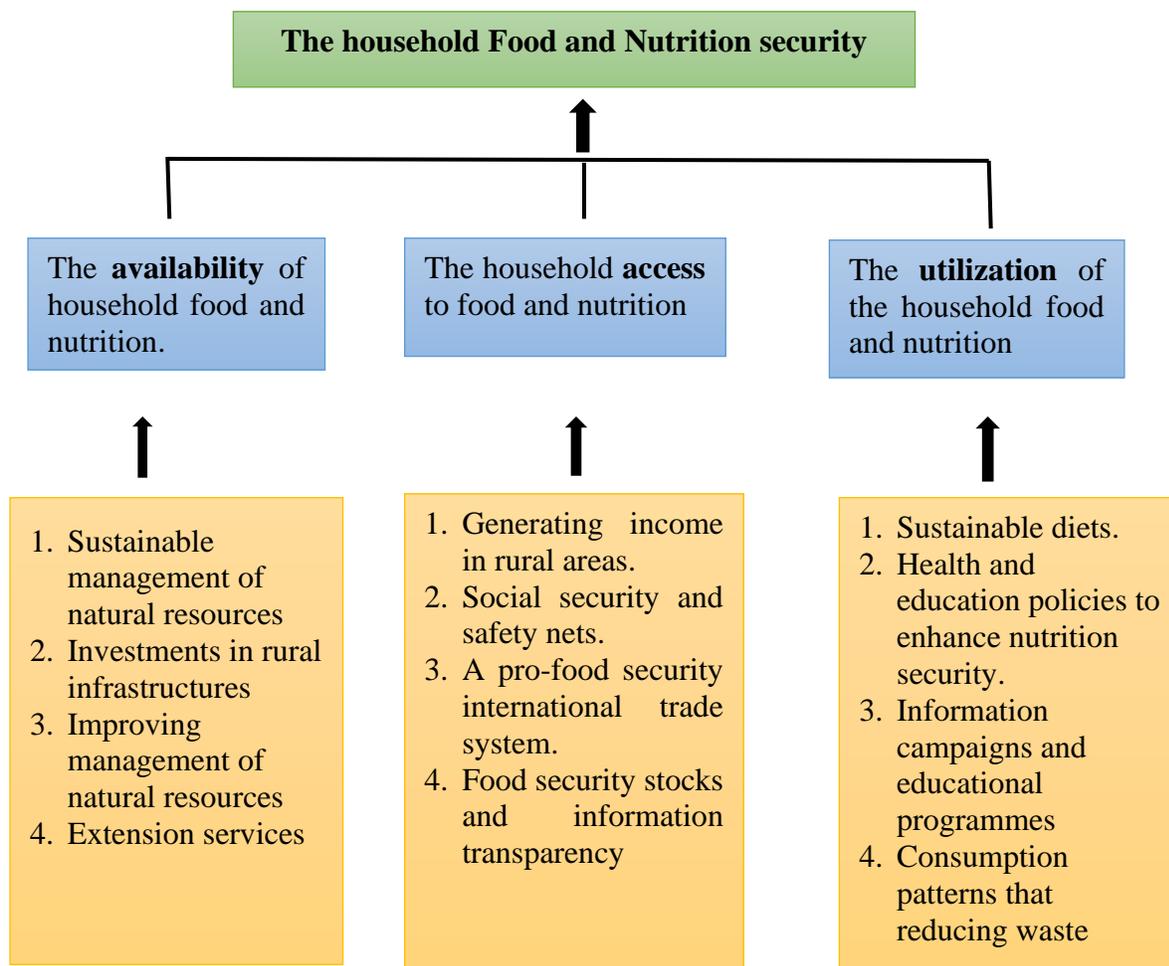
The table show the statistics of the children with mild and acute malnutrition for the period of three years from 2017 to 2019 recorded within Chasefu district. Good nutrition was essential for healthy and active lives that had direct bearing on the Food and Nutrition Security of the people (Martin, 2014).

II. LITERATURE REVIEW

Introduction

The literature review was guided by conceptual framework. This conceptual framework classified food and nutrition security into three concepts, namely; availability, accessibility and Utilization. Each concept was further subdivided to provide a deeper insight of the factors at play at achieving the stated concept as shown diagrammatically in figure 2.1 below (Conceptual Framework).

Figure 2.1: Conceptual Framework



Source: academic research writing, 2021.

DETERMINANTS OF HOUSEHOLD FOOD AND NUTRITION SECURITY

The household availability of food and nutrition

Availability referred to the physical existence of food, be it from own production or on the markets (FAO, IFAD, UNICEF, WFP and WHO. 2019). On national level food availability was a combination of domestic food production, commercial food imports, food aid, and domestic food stocks, as well as the underlying determinants of each of these factors. One of the factors to enable availability was commercialization (IAC, 2004). Commercialization entails expanded use of improved inputs and practices in food production, leading to higher yields and greater availability of food. Mechanization also reduced post-harvest losses, adding further to food availability. The result of these effects had been a steady increase in both the quantum and range of food available globally and in most regions of the world (FAO/IFAD/WFP, 2018). In developing countries, where the prevalence of undernourishment was higher and the population was growing faster, food production needed to almost double (Food and Agriculture Organization of the United Nations, 2009). Therefore, the first concern was increasing agricultural productivity, in particular in countries where the prevalence of hunger was higher and where large productivity gaps still existed. The main challenge, however, was to increase food production while minimizing the environmental impact and increasing natural resource use efficiency. In sub-Saharan Africa for instance, where the prevalence of undernourishment was high, important productivity gains on the order of a two-to -threefold increase in average yields was achieved through better use of existing knowledge and technology (Sunderland, 2013). Dissemination of information and technical

assistance was an effective strategy for improving access to knowledge and technology. Further, agricultural extension services were a useful tool for helping farmers increase their productivity, and collaborate with a broader network of farmers and researchers.

A survey conducted by the Global Conference on Agricultural Research for Development (GCARD) 2010 points to the importance of official agricultural extension workers. The general perception was that their number was inadequate, especially when measured against the needs of small-scale farm holders, who had limited access to the services they offered, services that represent an important vehicle for the transmission of knowledge, information and training (Sunderland, 2013). In addition to existing technology and agricultural knowledge which already provided a range of alternatives for achieving better outcomes for food and nutrition security, continuous research and development in respect of new technologies were needed. In this regard, an important lesson from the previous green revolution was that the development of new technology required long-term financial support for research and development, in parallel with wide and effective dissemination of information and know-how (United Nations, 2011). Research institutions also needed to expand their traditional disciplinary approach to encompass an interdisciplinary focus in response to wide-ranging farmer demands. For instance, transformation of diverse agro-ecological rural economies required the expertise of biologists, agronomists, water engineers, nutritionists, economists and social and political scientists (Sunderland, 2013).

An increase in food production also required integrating sustainable practices, in particular in the use of natural resources (Beddington and others,

2012). Many of the current agricultural practices had relied on cheap energy and abundant water and land, and were a leading source of greenhouse gas emissions. These practices were now proving unsustainable for the environment and health. At the same time, they had led to substantial productivity losses, thereby posing risks to food and nutrition security (Ibid, 2012). There were many factors leading to soil degradation that should have been prevented. The excessive use of chemical fertilizers and pesticides was considered the major factor affecting the resilience of land. For instance, in the past 50 years, global fertilizer use increased by 500 per cent, causing widespread pollution (Kennedy, Ballard, and Dop, 2011). Managing the use of fertilizers was crucial for long-term land development; for example, in the United States, it had been demonstrated that in the long term, organic agricultural methods outperformed conventional chemical farming in terms of crop yield, sustainability and profit.

Improving agricultural outcomes for food and nutrition availability, it required an integrated approach that promoted the resource efficiency of the whole agriculture and food system, while mitigating its environmental impacts (United Nations, 2011). In this regard, government policies needed to foster an agricultural innovation system approach to developing a comprehensive policy framework for innovation that respond to the double challenge of increasing agricultural productivity and achieving environmental sustainability (United Nations, 2011).

The household access to food and nutrition

Access was ensured when all households and all individuals within those households had sufficient resources to obtain appropriate foods for a nutritious diet (FAO, IFAD, UNICEF, WFP, 2019). It was

dependent on the level of household resources such as capital, labor, and knowledge as well dependent on prices. Note that adequate access could be achieved without households being self-sufficient in food production but of great importance, was the ability of households to generate sufficient income that, together with own production. Food access also was a function of the physical environment, social environment and policy environment that determined how effectively households were able to access their resources to meet their food security objectives (Martin, 2014). Such that, improving food availability was not sufficient to ensure access to food. Food and nutrition insecurity was more often the result of limited access to food.

If sufficient and nutritious food was both available and accessible, the household had to make decisions concerning what food was to be purchased, prepared and consumed and how the food was allocated within the individuals in the household. In households where distribution was unequal, even if the measured aggregate access was sufficient, some individuals would suffer from food deficiency (United Nations, 2011).

One of the factors that assured food and nutrition accessibility was the income capacity of the household. Poverty was obviously a main underlying factor preventing access to food. For instance, when comparing the highest and the lowest income quintiles of the population in developing countries, the poorer children were almost 3 times more likely to be underweight than children in the wealthiest 20 per cent of households (United Nations, 2012). Hence, increasing the income level of poor households would help ensure adequate food quantity and quality, and reduce the prevalence of undernourishment. However, in many regions and countries, economic growth had not been inclusive

enough to provide employment and income-earning opportunities for the poor. Food and Agriculture Organization of the United Nations, (2012) stated that as many poor people live in rural areas, it was not surprising that in those areas were the prevalence of undernourishment being higher. Therefore, economic growth generated demand for the assets controlled by the poor in particular the rural poor. Small farmers faced limited resources and assets, either for purchasing or for producing the quantity of food that was adequate to their needs. Empirically, it had been observed that the majority of the extremely poor and about half of the undernourished people in the world, that included 1.5 billion people in least developed countries, lived on small farms of less than two hectares, representing 90 per cent of farms worldwide (United Nations, 2011). Further, according to the most recent data, average farm sizes were declining in many countries, for example, in Africa, and in India (World Bank, 2008). Thus, addressing the issue of food and nutrition accessibility in rural areas necessarily implied responding to the challenges faced by smallholders. In particular, high inequality in distribution of assets such as land, water, capital, education and health care were a main obstacle that needed to be addressed so as to enhance access to food and nutrition.

The ability to generate income for the rural poor was the main determinant of food and nutrition security accessibility. A successful strategy for increasing rural households' income entails promoting the diversification of their farming activities. When comparing households relying on more diversified farming activities with those that remain engaged in more traditional farming, it was evident that the former was more successful in moving out of poverty. In Uganda, for instance, the combination of higher productivity of land and diversification of

crops, in particular cash crops, had led to lower rural poverty (World Bank, 2008). In addition, a diversified farming system, integrating, for instance, horticulture and livestock, enhanced nutritional outcomes and improved rural households' access to foods from animal sources, fruits and vegetables. In Viet Nam, for example, the vegetation, aquaculture, and cages for animal Husbandry (VAC) system, that included a diversified farming system at the household level, had contributed to improvements in both incomes and nutritional outcomes, in terms of consumption of foods from animal sources and fruits and vegetables (Food and Agriculture Organization of the United Nations, 2013). This experience showed that integrated farming projects were particularly successful in raising micronutrient intake, in addition to improving income stability.

An appropriate institutional setting was also crucial for supporting small-scale farming, so as to increase agricultural investment and productivity, while preserving natural resources. Improving women's access, for instance, to several assets, such as land, input markets and technology, increased agricultural production by as much as 2.5 to 4.0 per cent, thereby reducing the number of undernourished people by 12 to 17 per cent, equivalent to freeing 100 million to 150 million people from hunger (Food and Agriculture Organization of the United Nations, 2011).

In today's interdependent world, the implementation of national strategies to improve access to food and nutrition also required concrete actions at the global level. As observed during the 2007 to 2008 food price crisis, higher food prices deeply affected nutrition and macroeconomic conditions of net food importing countries, especially in sub-Saharan Africa (Food and Agriculture Organization of the United Nations, 2011).

The household utilization of food and nutrition

Focusing on the individual level of food and security also required taking the biological utilization of food into consideration. This referred to the ability of the human body to take food and convert it into either energy that was either used to undertake daily activities or was stored. Utilization required not only an adequate diet, but also a healthy physical environment, including safe drinking water and adequate sanitary facilities (so as to avoid disease) and an understanding of proper health care, food preparation, and storage processes.

Nutrition outcomes were largely determined not only by food production and accessibility but also by food quality and diversity (Food and Agriculture Organization, 2010). A considerable potential for increasing the nutritional status of people and the efficiency of the whole food chain lie in encouraging changes in diet and consumption patterns, as well as designing pro-nutrition policies in other sectors, such as health and education (Mmari, Hawasa, and Kinyashi, 2010). In addition, reducing food losses was a cost-effective means of increasing the availability of safe and nutritious food for all. Preventing food wastage reduced the challenge of how to increase production in a world with limited natural resources. To ensure utilization for food and nutrition security at household level, there was a strong consensus that better nutrition required pro-nutrition policies in other, related sectors. Public policies and programmes designed to improve health, water and sanitation services were of particularly importance. Increasing individuals' awareness of the benefits of healthier diets, through information campaigns and educational programmes, was also relevant (Mmari, Hawasa, and Kinyashi, 2010). Hence, health and educational

policies need to incorporate nutrition-related considerations in their programmes

In the case of lower-income groups in developing countries, the income elasticity of demand for dietary energy was positive and greater than for other income groups (Food and Agriculture Organization of the United Nations, 2012). However, as income increases, there was a tendency to purchase more expensive foods, based on taste preferences that were not improving nutrition outcomes. In many cases, individuals were unaware of the health problems associated with consuming certain types of foods, as well as of the importance of certain micronutrients. In developed countries, people were unaware of the health problems associated with a less diversified diet and consumption of specific foods. In countries where overweight and obesity had increased, diets had typically shifted towards higher intake of energy-dense foods that were high in fat, salt and sugars but low in vitamins, minerals and other micronutrients.

Thus, education programmes improved the health and nutritional status of the population in general, and of women and children in particular. Women with better education were more aware of the importance of adequate diets and secured access to better-paying jobs. Several studies had shown that women with higher income had greater bargaining power within the family and exerted a more positive influence on child nutrition, health and education outcomes (Food and Agriculture Organization of the United Nations, 2013).

Inculcating basic knowledge of good nutrition, including family nutrition practices, in primary and secondary schools, could help individuals make informed dietary choices. Nutrition education needed be included in the school curriculum and

offered in community centers targeting adults. In addition to education, information and nutrition advocacy had positive impacts on population conditions related to nutrition. Strategies aimed at influencing consumer choice based on enhanced consumer awareness and knowledge needed to be considered, as they led to a change in consumption habits. Dietary guidelines constituted one example of the public information tools used in many countries that was encouraged. Information and communications measures were particularly relevant to preventing obesity. However, nutrition-related messages needed to be appropriate in order to be effective. They needed to be delivered by health professionals, among others, through a variety of channels and over an extended period of time.

Globally, approximately one third of the total food produced for consumption, amounting to 1.3 billion tons per year, is lost or wasted (Food and Agriculture Organization of the United Nations, 2012). Because of food waste, an opportunity was lost to reduce malnutrition and unnecessary pressure was imposed on natural resources, including through greenhouse gas emissions caused by production of food. There were several sources of food wastage throughout the supply chain, from initial agricultural production down to final household consumption.

The amount of food wasted in developed countries was higher than that in developing countries. Recent estimations showed that the weight of food wasted per capita by consumers in Europe and North America amounts to 95 to 115 kg/year, compared with the figure for sub-Saharan Africa and South and South-East Asia, which is only 6 to 11 kg/year (Food and Agriculture Organization of the United Nations, 2012). In developed countries, food wastage occurred more frequently at the retail and consumer

end, owing, in part, to management practices and consumption habits.

Resilient food sources in Zambia.

Resilience was a somewhat positive concept, as it referred to the capacity for adaptation to emerging circumstances. In this regard, resilient food sources referred to those food varieties with the capacity for adaptation to emerging circumstances and were grown year-round (Tanner, 2010)

The three main elements of the right to food and food security in Zambia central to the research were availability, adequacy and accessibility (De Schutter 2014). Small-scale agriculture remained an important source of employment, income and food in the country. Control over resources for agricultural production and the sale of agricultural output meant that farmers determined what to grow and, more importantly, how much to reserve for household consumption and how much to sell to earn income for meeting household needs and supplementing their diets for optimum nutrition. With 67% of the population dependent on agriculture for their income, livelihood and food access, agriculture remains an important sector in Zambia (IAPRI 2015). Currently, agriculture accounts for nearly 11% of GDP, making it the second largest sector after copper mining that made up 80% of foreign earnings (AFDB, UNDP and OECD 2016). The Government of Zambia had identified the agriculture sector as one of the key priority sectors for economic development and poverty reduction, as highlighted in the Sixth National Development Plan (SNDP) and the National Agriculture Investment Plan (NAIP). By placing emphasis on pro-poor, agricultural-led economic development, the NAIP placed focuses on small-scale farmers as key actors in the development of agriculture that would promote food and nutrition

security at household level (Cabral and Norfolk, 2016).

The Ministry of Agriculture listed key initiatives and activities that were implemented to promote agricultural development which was a key sector for household food and nutrition security. These include: alienating land for farming blocks on state-owned 'virgin land' in all ten provinces to attract local and international investors. The Farm Block Development was introduced through a Presidential decree in 2002. It further, initiated an irrigation programme to improve productivity levels and boost crop yields. In view of climate change effects, the ministry wanted to reduce rain fed agriculture (Cabral and Norfolk, 2016). Government was also promoting mechanization through the use of new farming technologies and equipment. Through the Farming Input Support Programme (FISP), government was supporting and protecting small-scale farmers. Ideally, FISP was meant to help farmers boost productivity so that, after two farming seasons, farmers become more successful and graduate and become more food and nutrition secure (Refiloe, Phillan, Clemente, Patrick and Ceasar, 2016).

Agri-business was also trying to promote the orthodox commercial production model through advice and training. More and more farmers in rural areas for example were adopting conservation farming along without the use of chemical fertilizers, herbicides and pesticides in an effort to improve their productivity and production output at household level. As a result, an increasing number of small-scale farmers in rural areas were growing the staple food and other crop such as soya beans (Refiloe, Phillan, Clemente, Patrick and Ceasar, 2016). The promotion of soya production had been driven by agri-business interventions and government policy,

aimed at boosting household income and diversifying diets to ensure food security and nutrition at the local and national level. Alongside promotion of soya beans in rural areas, the government was promoting drought-resistant crops, such as sorghum, to ensure diversification of diets for food and nutrition security (FRA 2016).

Production system changes, new farming practices and the introduction of new crops and new crop varieties were significantly transforming consumption patterns, dietary diversity and household food security (Refiloe, Phillan, Clemente, Patrick and Ceasar, 2016). However, the use of herbicides in production systems introduced by new agro-investors had therefore partly contributed to the disappearance of indigenous vegetables and crops that were grown alongside maize and other cash crops (FRA 2016).

Food adequacy, a component of food security and the right to food, was concerned with dietary diversity and highlighted the importance of nutrition in food consumption patterns, taking into account the individual's age, living conditions, health, occupation, sex, etc. (De Schutter 2014). There was an evident lack of dietary diversity in rural areas, as very few households could afford fruits, meat protein and milk in a week. The dominant meal was nshima (staple food, thick porridge made from mielie meal) and vegetables. All the farmers who were interviewed eat at least one nshima meal every day. From our interviews, the well-off families were able to secure three meals a day that was customary in Zambia. The food basket of well-off households, particularly those who had non-farm sources of income, includes milk, meat, fish, fruit, sugar, rice and bread. Poorer household had less dietary diversity as they relied more on their own food crops and only purchased processed foods such as cooking

oil, tea, salt and sugar. As Tanner, (2010) argue, availability, whether from own production or procured from markets, was key component of food and nutrition security.

Household food security was differentiated across the farmers, but it was important to note that the majority in rural areas seem not to be food secure. Well-off households that typically produced more food had higher frequency of meals and dietary diversity compared to the less well-off categories. This was explained by a variety of factors, including differences in agricultural production, which were determined by different strategies for gaining access to farm inputs and labour (De Schutter 2014). For instance, small-scale farmers who raised poultry and goats generally eat meat more often than those without livestock. The vast majority of households that do not own livestock indicated that they can only afford to eat meat once a fortnight. In short, ownership of different kinds of livestock and variety in crop production were differentiating factors in the everyday life of small-scale farmers.

The diversifying food baskets under the assumption that cash crops bring substantial wage and employment opportunities to the rural economy, view the promotion of resilient crops and new seed varieties as a means of improving food and nutrition security and livelihood (Refiloe, Phillan, Clemente, Patrick and Ceasar, 2016).

III. METHODOLOGY

The study employed descriptive research design using both quantitative and qualitative research methods to collect data on the factors influencing household Food and Nutrition security in Zambia. This research design was considered adequate as it provided useful way of reporting the way things were (Mugenda and Mugenda, 2008). According to Creswell, (2012) further stated that descriptive research design was useful for assessing group of people's knowledge, attitudes, practices and perceptions. The study was conducted in the rural areas found in Chasefu District of the Eastern Province of Zambia to an estimated population of about 680 people that were household heads, traditional local leadership, civic leaders, non-governmental organization workers and Agriculture extension workers working in the locality. Out of which, 80 people were selected purposively as a representative sample to whom the questionnaires were administered. The researcher targeted individuals involved in Food and Nutrition Systems within the identified area and those of influence and authority. This was done to ensure a fair representation of the subgroups responsible for household food and nutrition in the study sample. A sample was defined as a portion of the population selected from the entire population as a representative (Creswell, 2014).

The researcher used the questionnaire as a data research instrument to all the eighty (80) respondents. The questionnaire comprised closed ended questions as well as Likert rated scales format questions. The questionnaire was chosen because of the fact that this data collecting instrument enabled the researcher to gather data over a large geographical area. Kisilu and Tromp (2011) explained that the questionnaire upholds

respondents' confidentiality and had no opportunity for the researcher's bias in the study and that it collected raw data over a large geographical disposition. Additionally, the Covid 19 pandemic in relation to the health guidelines to avoid contracting it and transmission, the questionnaire was the ideal research instrument because it reduced significantly on contact with the respondents.

Upon obtaining permission from Chasefu district Administrative Office, the researcher proceeded to question distribution and collection. All the collected questionnaires were manually screened and sorted out on the basis of completeness of data. The data was then analyzed by use of the Statistical Package for Social Sciences Version Twenty-five (SPSS – V25). Descriptive statistics was employed to analyze and interpret the data from the respondents through the use of frequency tables.

IV. FINDINGS

The purpose of the study was to investigate factors influencing Household Food and Nutrition Security in Zambia that was a case of rural areas in Chasefu District / Eastern Province of Zambia. This chapter present the data collected and the results of the analysis with corresponding interpretation.

Availability of food refers to the physical existence of food, be it from own production or on the markets

Table 1 and figure 1 indicates responses to whether respondents were aware that availability of food refers to the physical existence of food, be it from own production or on the markets.

TABLE 1: Availability of food refers to the physical existence of food, be it from own production or on the markets

	Freq	Percent	Valid Percent	Cumulative Percent
Val id STRONGLY DISAGREED	2	2.5	2.5	2.5
DISAGREED	5	6.2	6.2	8.8
NEUTRAL	11	13.8	13.8	22.5
AGREED	50	62.5	62.5	85.0
STRONGLY AGREED	12	15.0	15.0	100.0
Total	80	100.0	100.0	

SOURCE: RESEARCH FINDINGS 2021

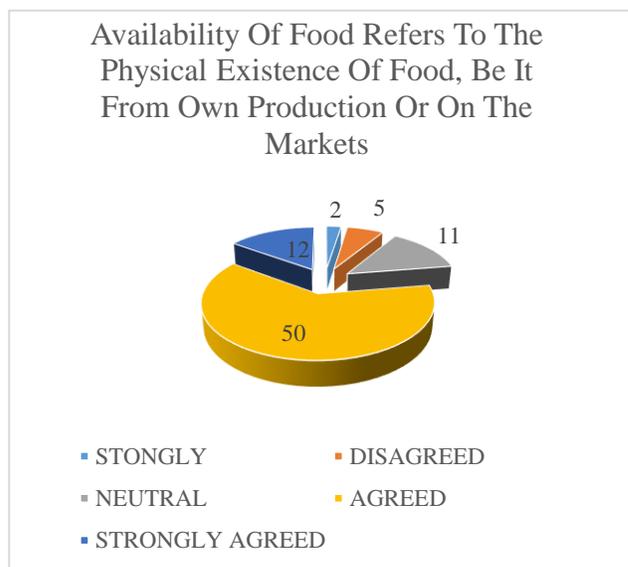


FIGURE 1: Availability of food refers to the physical existence of food, be it from own production or on the markets

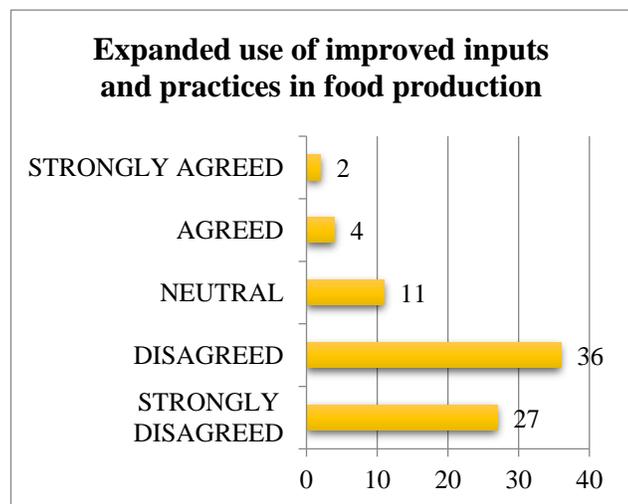
SOURCE: Research findings, 2021

Results in Table 1 and figure 1 above revealed the following; 2.5% (n=2) strongly disagreed, 6.2% (n=5) disagreed, 11 13.8% (n=11) were neutral, 62.5% (n=50) agreed and 15% (n=12) strongly agreed that availability of food referred to the physical existence of food, be it from own production or on the markets. It was concluded that the respondents agreed that availability of food referred to the physical existence of food, be it from own production or on the markets based do the majority representation of the respondents that agreed and strongly agreed respectively.

Expanded use of improved inputs and practices in food production

The responses to whether households in rural areas employed the expanded use of improved inputs and practices in food production are shown in table 2 and figure 2 below.

FIGURE 2: Expanded use of improved inputs and practices in food production



Source: Research findings, 2021

TABLE 2: Expanded use of improved inputs and practices in food production

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid STRONGLY DISAGREE	27	33.8	33.8	33.8
DISAGREE	36	45.0	45.0	78.8
NEUTRAL	11	13.8	13.8	92.5
AGREE	4	5.0	5.0	97.5
STRONGLY AGREE	2	2.5	2.5	100.0
Total	80	100.0	100.0	

Source: Research findings 2021

Table 2 and figure 2 above illustrated the following data; 33.8% (n=27) of the respondents strongly disagreed, 45% (n=36) disagreed, 13.8% (n=11) were neutral, 5% (n=4) agreed 2.5% (n=2) strongly agreed. Clearly, results of the study reveal that there was no expanded use of improved inputs and practices in food production in Chasefu district that was aimed to promote availability for food and nutrition security.

Additional investments in rural infrastructure, including in harvest technologies designed to reduce wastage at the production level.

The respondents were asked to give their opinions on if at all additional investments in rural infrastructure, including in harvest technologies designed to reduce wastage at the production level were available. The responses are indicated in table 3 and figure 3 below.

TABLE 3: Additional Investments in Rural Infrastructure, Including in Harvest Technologies Designed to Reduce Wastage at The Production Level

		Freq uency	Perc ent	Valid Percen t	Cumul ative Percent
Val id	STRONGLY DISAGREE	33	41.2	41.2	41.2
	DISAGREE	38	47.5	47.5	88.8
	NEUTRAL	5	6.2	6.2	95.0
	AGREE	4	5.0	5.0	100.0
	Total	80	100.0	100.0	

SOURCE: RESEARCH FINDINGS 2021

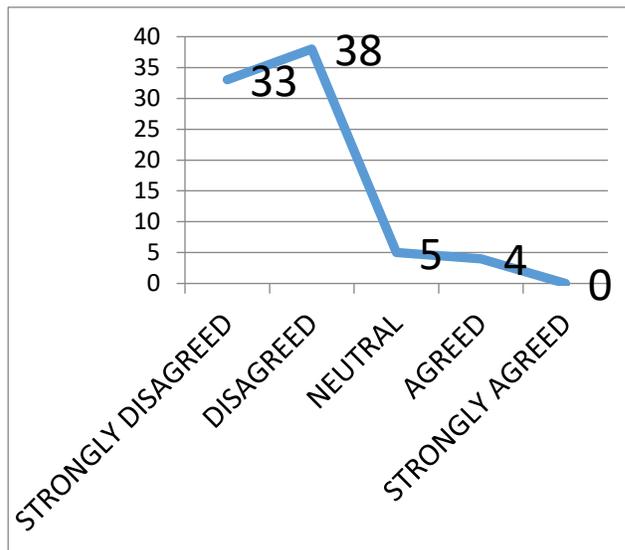


FIGURE 3: Additional investments in rural infrastructure, including in harvest technologies designed to reduce wastage at the production level

Source: Research findings 2021

Table 3 and figure 3 above show raw data as to whether additional investments in rural infrastructure, including in harvest technologies designed to reduce wastage at the production level were present. A total of 41.2% (n=33) respondents out the 80-sample representation strongly disagreed, 47.5% (n=38) disagreed, 6.2% (n=5) were neutral and 5% (n=4) agreed while none of the respondents strongly agreed that additional investments in rural infrastructure, including in harvest technologies designed to reduce wastage at the production level were present. Thus, there was no additional investments in rural infrastructure, including in harvest technologies designed to reduce wastage at the production level for food and nutrition availability.

Have agricultural extension services for dissemination of information and technical assistance for helping farmers increase their productivity

The respondents were asked whether in Chusefu district they had Agriculture Extension Services for the dissemination of information and technical assistance for helping farmers increase their production. Table 5 and figure 5 below indicate the respondents' responses.

TABLE 5: Have agricultural extension services for dissemination of information and technical assistance for helping farmers increase their productivity.

	Frequency	Percent	Valid Percent	Cumulative Percent
Val id STRONGLY DISAGREE	5	6.2	6.2	6.2
DISAGREE	7	8.8	8.8	15.0
NEUTRAL	11	13.8	13.8	28.8
AGREE	47	58.8	58.8	87.5
STRONGLY AGREE	10	12.5	12.5	100.0
Total	80	100.0	100.0	

Source: Research findings, 2021.

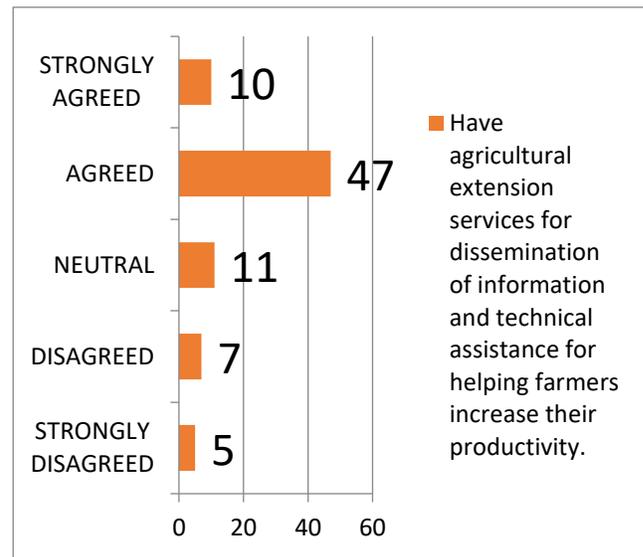


FIGURE 5: Have agricultural extension services for dissemination of information and technical assistance for helping farmers increase their productivity

SOURCE: Research findings, 2021.

Table 5 and figure 5 brought out raw data as to whether rural areas in Chusefu district had agricultural extension services for dissemination of information and technical assistance for helping farmers increase their productivity. It was found out that 5 respondents that represented 6.2% (n=5) strongly disagreed, 8.8% (n=7) disagreed, 13.8% (n=11) were neutral, 58.8% (n=47) agreed and 12.5% (n=10) strongly agreed. Therefore, rural areas in Chusefu district had agricultural extension services for dissemination of information and technical assistance for helping farmers increase their productivity based on the majority respondents that agreed and strongly agreed respectively.

Food production integrates sustainable practices, in particular in the use of natural resources

The respondents brought out their understanding as to whether food production in Chasefu district integrated sustainable practices, in particular in the use of natural resources. Table 6 and figure 6 below illustrate the responses.

TABLE 6: Food production integrates sustainable practices, in particular in the use of natural resources

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid STRONGLY DISAGREE	16	20.0	20.0	20.0
DISAGREE	41	51.2	51.2	71.2
NEUTRAL	14	17.5	17.5	88.8
AGREE	6	7.5	7.5	96.2
STRONGLY AGREE	3	3.8	3.8	100.0
Total	80	100.0	100.0	

Source: Research findings, 2021.

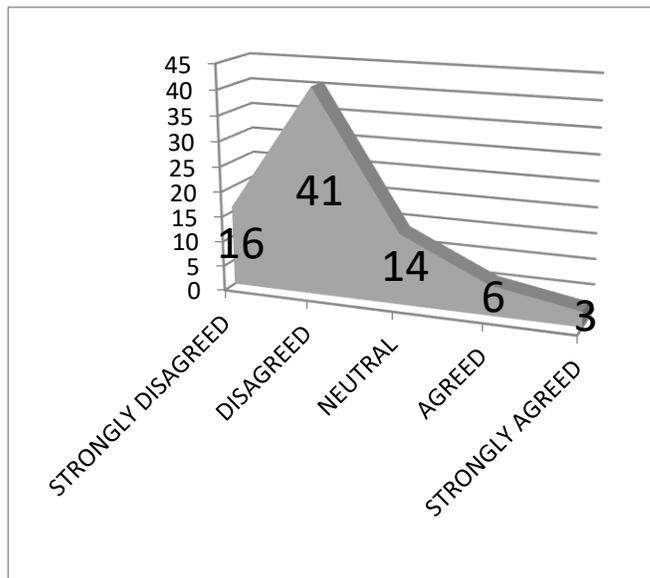


FIGURE 4.9: Food production integrates sustainable practices, in particular in the use of natural resources.

Source: Research findings, 2021.

The responses were that 20% (n=16) strongly disagreed, 51.2% (n=41) disagreed, 17.5% (n=14) were neutral, 7.5% (n=6) agreed and 3.8% (n=3) of the total sample strongly agreed. Certainly, from the responses, it was concluded that food production in rural areas did not integrate sustainable practices, in particular in the use of natural resources that affected food and nutrition availability.

Access to food is ensured when all households and all individuals within those households have sufficient resources to obtain appropriate foods for a nutritious diet.

When asked to state whether Access to food was ensured when all households and all individuals within those households had sufficient resources to obtain appropriate foods for a nutritious diet, table 7 and figure 7 below show the respondents' responses.

TABLE 7: Access to food was ensured when all households and all individuals within those households had sufficient resources to obtain appropriate foods for a nutritious diet

	Frequency	Percent	Valid Percent	Cumulative Percent
Val id DISAGREE	6	7.5	7.5	7.5
NEUTRAL	10	12.5	12.5	20.0
AGREE	52	65.0	65.0	85.0
STRONGLY AGREE	12	15.0	15.0	100.0
Total	80	100.0	100.0	

Source: Research findings, 2021.

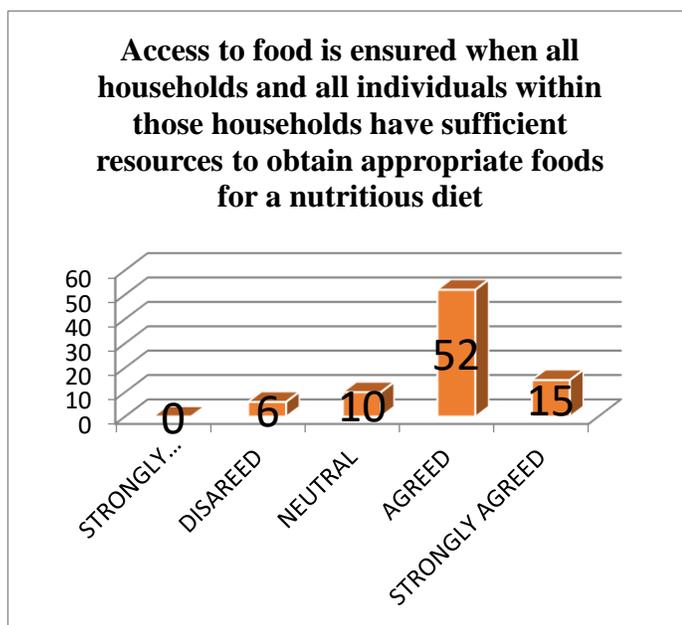


FIGURE 7: Access to food was ensured when all households and all individuals within those households have sufficient resources to obtain appropriate foods for a nutritious diet.

The responses were that respondents representing 7.5% (n=6) disagreed while none strongly disagreed, 12.5% (n=10) were neutral, 65% (n=52) agreed and 15% (n=12) strongly agreed that access to food was ensured when all households and all individuals within those households had sufficient resources to obtain appropriate foods for a nutritious diet.

All people at all times have physical, social and economic access to food, which is consumed in sufficient quantity and quality.

When asked to specify whether all people at all times had physical, social and economic access to food, that was consumed in sufficient quantity and quality, respondents' responses were summarized in table 8 and figure 8 below;

TABLE 8: All people at all times have physical, social and economic access to food, which is consumed in sufficient quantity and quality.

	Frequency	Percent	Valid Percent	Cumulative Percent
Val id STRONGLY DISAGREE	46	57.5	57.5	57.5
DISAGREE	27	33.8	33.8	91.2
AGREE	7	8.8	8.8	100.0
Total	80	100.0	100.0	

Source: Research findings, 2021.

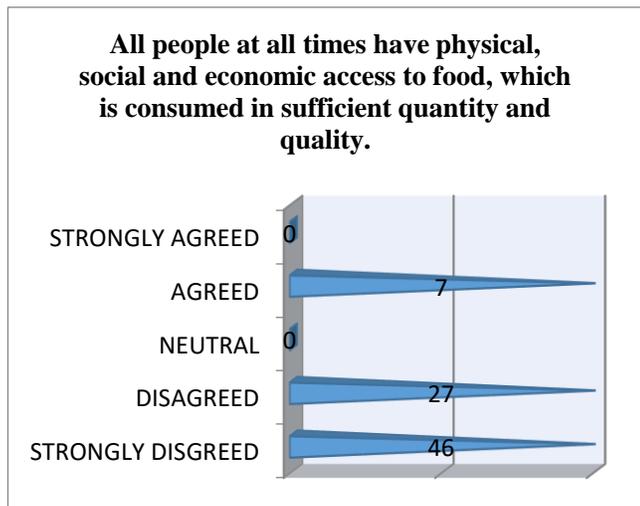


FIGURE 8: All People at All Times Have Physical, Social and Economic Access to Food, Which Is Consumed in Sufficient Quantity and Quality.

Source: Research findings, 2021.

57.5% (n=46) of the total sample strongly disagreed, 27 respondents representing 33.8% (n=27) disagreed, 8.8% (n=7) agreed while none of the respondents were neutral and or strongly agreed to the assertion. Thus, one of the factors influencing food and nutrition in Chasefu district was that the households all people at all times had no physical, social and economic access to food that was consumed in sufficient quantity and quality.

People have the ability to generate sufficient income which, together with own production, can be used to meet their dietary needs and food preferences.

Table 9 and figure 9 below brought out data on whether people had the ability to generate sufficient income that together with their own production could be used to meet their dietary need and food preferences.

TABLE 9: People have the ability to generate sufficient income which, together with own production, can be used to meet their dietary needs and food preferences.

	Frequency	Percent	Valid Percent	Cumulative Percent
STRONGLY DISAGREE	14	17.5	17.5	17.5
DISAGREE	55	68.8	68.8	86.2
NEUTRAL	6	7.5	7.5	93.8
AGREE	5	6.2	6.2	100.0
Total	80	100.0	100.0	

Source: Research findings, 2021.

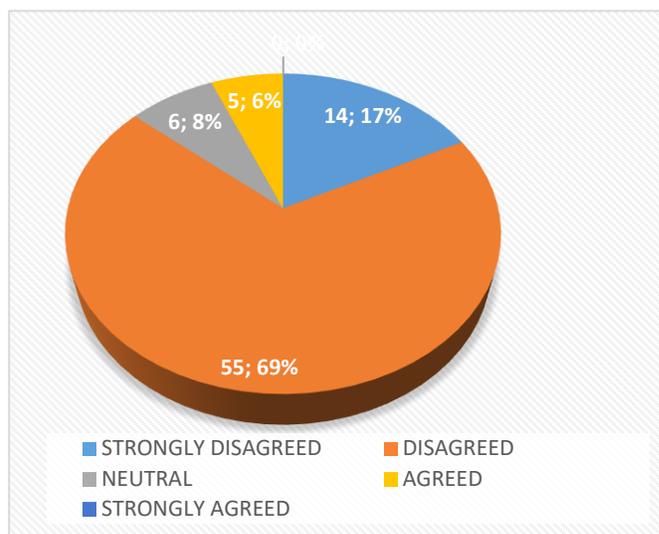


FIGURE 9: People have the ability to generate sufficient income which, together with own production, can be used to meet their dietary needs and food preferences.

Source: Research findings, 2021.

A frequency that represented 17.5% (n=14) strongly disagreed, 68.8% (n=55) disagreed, 7.55% (n=6) were neutral and 6.2% (n=5) agreed while none of the respondents strongly agreed that people had the ability to generate sufficient income that together with their own production could be used to meet their dietary need and food preferences.

Have appropriate institutional setting so as to increase agricultural investment through women’s access to several assets, such as land, input markets and technology

As to whether Chusefu district had appropriate institutional setting so as to increase agricultural investment through women’s access to several assets, such as land, input markets and technology, the responses were distributed as follows in table 10 below;

TABLE 10: Have appropriate institutional setting so as to increase agricultural investment through women’s access to several assets, such as land, input markets and technology

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid STRONGLY DISAGREE	20	25.0	25.0	25.0
DISAGREE	57	71.2	71.2	96.2
AGREE	3	3.8	3.8	100.0
Total	80	100.0	100.0	

Source: Research findings, 2021.

The respondents representing 25% (n=20) strongly disagreed, 71.2% (n=57) disagreed that rural areas in Chusefu district had appropriate institutional setting so as to increase agricultural investment through women’s access to several assets, such as land, input markets and technology. A frequency representing 3.8% (n=3) agreed while none of the respondents were neutral or had strongly agreed to the assertion. It was concluded that rural areas did not have appropriate institutional setting so as to increase agricultural investment through women’s access to several assets, such as land, input markets and technology.

There were information campaigns and educational programmes at household and community level designed to improve health, water and sanitation services.

Table 11 and figure 10 below brought out the respondents’ distribution on whether there were information campaigns and educational programmes at household and community level designed to improve health, water and sanitation services.

TABLE 11: There are information campaigns and educational programmes at household and community level designed to improve health, water and sanitation services.

	Frequency	Percent	Valid Percent	Cumulative Percent
Val STRONGLY DISAGREE	14	17.5	17.5	17.5
DISAGREE	51	63.8	63.8	81.2
NEUTRAL	11	13.8	13.8	95.0
AGREE	4	5.0	5.0	100.0
Total	80	100.0	100.0	

Source: Research findings, 2021.

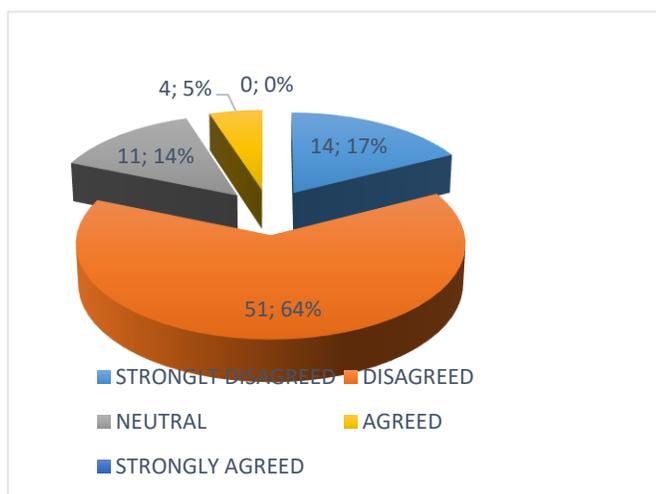


FIGURE 10: There were information campaigns and educational programmes at household and community level designed to improve health, water and sanitation services.

Source: Research findings, 2021.

The respondents representing 17.5% (n=14) strongly disagreed, 63.8% (n=51) disagreed, 11 13.8% (n=11) were neutral and 5% (n=4) agreed while none of the respondents strongly agreed that there were information campaigns and educational programmes at household and community level designed to improve health, water and sanitation services in rural areas found in Chusefu district aimed at food and nutrition security.

Resilient food sources refer to those food varieties with the capacity for adaptation to emerging circumstances and may be grown year-round aimed at addressing food and nutrition at household level.

Responses were sought from the respondents on whether they were aware that resilient food sources refer to those food varieties with the capacity for adaptation to emerging circumstances and may be grown year-round aimed at addressing food and nutrition at household level. Table 12 and figure 11 illustrates the responses....

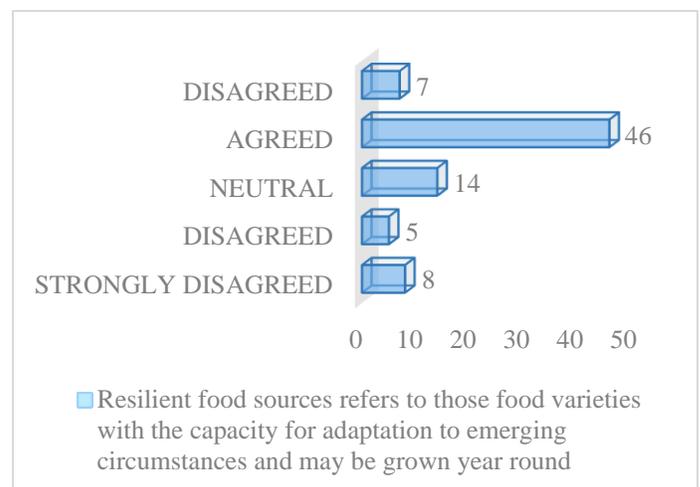
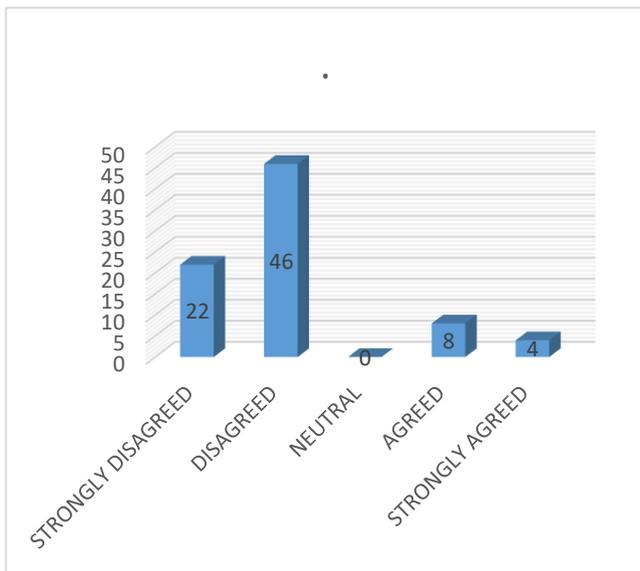


TABLE 12: Resilient food sources refers to those food varieties with the capacity for adaptation to emerging circumstances and may be grown year-round aimed at addressing food and nutrition at household level

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid STRONGLY DISAGREE	8	10.0	10.0	10.0
DISAGREE	5	6.2	6.2	16.2
NEUTRAL	14	17.5	17.5	33.8
AGREE	46	57.5	57.5	91.2
STRONGLY AGREE	7	8.8	8.8	100.0
Total	80	100.0	100.0	



Source: Research findings, 2021.

Respondents representing 10% (n=8) strongly disagreed, 6.2% (n=5) disagreed, 17.5% (n=14) were

neutral, 57.5% (n=46) agreed and 8.8% (n=7) strongly agreed that resilient food sources referred to those food varieties with the capacity for adaptation to emerging circumstances and may be grown year-round.

Have irrigation programme to improve productivity levels and boost crop yields at household level.

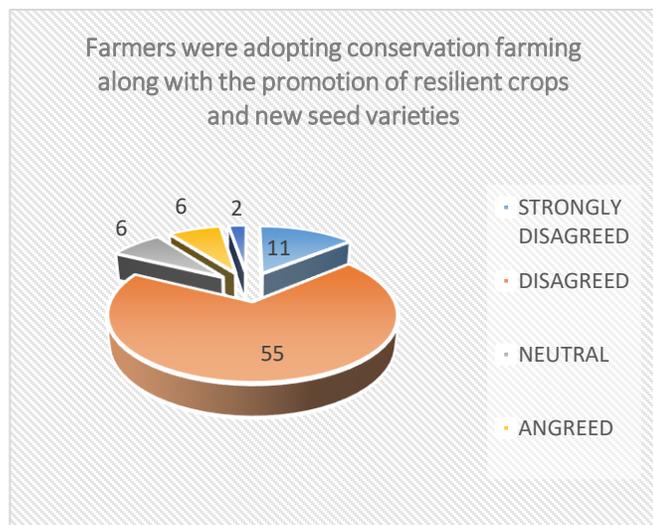
The respondents were asked to give their opinions whether Chasefu district had irrigation programme to improve productivity levels and boost crop yields at household level. The responses were presented as shown in table 13 and figure 12 below:

TABLE 13: Have irrigation programme to improve productivity levels and boost crop yields at household level.

	Frequency	Percent	Valid Percent	Cumulative Percent
STRONGLY DISAGREE	22	27.5	27.5	27.5
DISAGREE	46	57.5	57.5	85.0
AGREE	8	10.0	10.0	95.0
STRONGLY AGREE	4	5.0	5.0	100.0
Total	80	100.0	100.0	

Source: Research findings, 2021.

FIGURE 12: Have Irrigation Programme to Improve Productivity Levels and Boost Crop Yields at Household Level.



Source: Research findings, 2021.

A frequency 27% (n=22) strongly disagreed, 57.5% (n=46) disagreed, none of the respondents were neutral, 10% (n=8) agreed and 5% (n=4) strongly agreed that Chasefu district had irrigation programme to improve productivity levels and boost crop yields at household level.

Farmers were adopting conservation farming along with the promotion of resilient crops and new seed varieties.

Responses were sought on whether farmers were adopting conservation farming along with the promotion of resilient crops and new seed varieties in Chasefu district to enhance household food and nutrition. The data was presented in table 13 and figure 12 below:

TABLE 13: Farmers were adopting conservation farming along with the promotion of resilient crops and new seed varieties

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	11	13.8	13.8	13.8
	Disagree	55	68.8	68.8	82.5
	Neutral	6	7.5	7.5	90.0
	Agree	6	7.5	7.5	97.5
	Strongly Agree	2	2.5	2.5	100.0
	Total		80	100.0	100.0

Source: Research findings, 2021.

The frequency representing 13.8% (n=11) strongly disagreed, 68.8% (n=55) disagreed, 7.5% (n=6) were neutral, 7.5% (n=) agreed and 2.5% (n=2) strongly agreed to the assertion. It was concluded bases on the response rate that the majority disagreed that farmers and household in Chasefu district were not adopting conservation farming along with the promotion of resilient crops and new seed varieties.

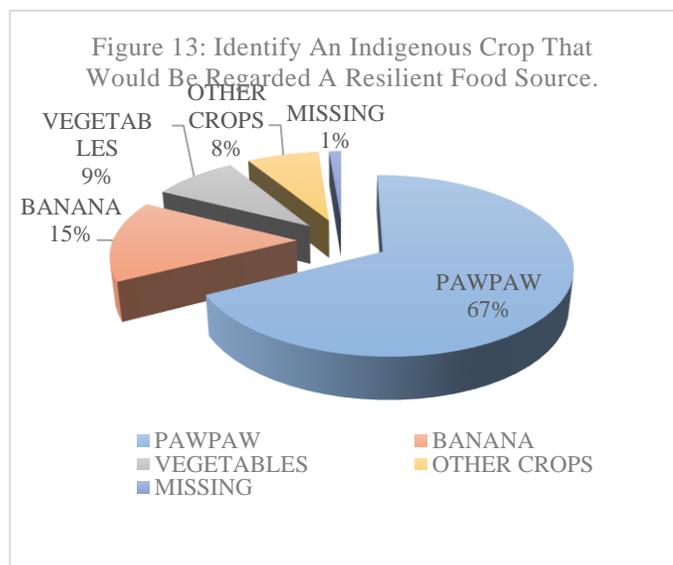
Identify an indigenous crop that would be regarded a resilient food source.

The respondents were requested to identify within their communities an indigenous crop that would be regarded a resilient food source for household food and nutrition. Responses were recorded in table 14 and figure 13 below:

TABLE 14: Identify an indigenous crop that would be regarded a resilient food source.

	Freq	Percent	Valid Percent	Cumulative Percent
Valid PAWPA W	54	67.5	68.4	68.4
BANANA	12	15.0	15.2	83.5
VEGETABLES	7	8.8	8.9	92.4
OTHER	6	7.5	7.6	100.0
Total	79	98.8	100.0	
Missing System	1	1.2		
Total	80	100.0		

Source: Research findings, 2021.



Source: Research findings, 2021.

A frequency representing 67% (n=54) of the total sample said it was Pawpaw, 15% (n=12) said it was Banana, 8.8% (n=7) said it was vegetables and 7.5%

(n=6) indicated that another crop 1.2% (n=1) did not indicate any. It was concluded that respondents had identified Pawpaw as an indigenous crop that would be regarded a resilient food source

V. DISCUSSION

Availability of food refers to the physical existence of food, be it from own production or on the markets

It was concluded that the respondents agreed that availability of food referred to the physical existence of food, be it from own production or on the markets based do the majority representation of the respondents that agreed and strongly agreed respectively. This assertion was supported by FAO, IFAD, UNICEF, WFP and WHO. (2019) who in their document that indicated to say that availability was referred to the physical existence of food, be it from own production or on the markets. IAC, (2004) went on to elaborate in an earlier document that on national level, food availability was a combination of domestic food production, commercial food imports, food aid, and domestic food stocks, as well as the underlying determinants of each of these factors. As Tanner, (2010) argue, availability, whether from own production or procured from markets, was key component of food and nutrition security.

Expanded use of improved inputs and practices in food production

Clearly, results of the study reveal that there was no expanded use of improved inputs and practices in food production in Chasefu district that was aimed to promote availability for food and nutrition security. Reardon, et al., (2009) supported expanded use of improved inputs and practices in food production because it led to higher yields and greater availability

of food. The farming dynamics further reduced post-harvest losses, adding further to food availability. If smallholders and rural small and medium-sized enterprises (SMEs) were to participate in and benefit from the transformation, they, too, needed to embrace these essential dynamics that were the core drivers of structural and rural transformation at increasingly fundamental food production and trade.

Additional investments in rural infrastructure, including in harvest technologies designed to reduce wastage at the production level

Thus, there was no additional investments in rural infrastructure, including in harvest technologies designed to reduce wastage at the production level for food and nutrition availability. Food and Agriculture Organization of the United Nations, (2009) stated that in developing countries such as Zambia, where the prevalence of undernourishment was higher and the population was growing faster, food production needed to almost double. Therefore, the first concern was increasing agricultural productivity through additional investments in rural infrastructure, including in harvest technologies designed to reduce wastage at the production level.

Have agricultural extension services for dissemination of information and technical assistance for helping farmers increase their productivity

Rural areas in Chasefu district had agricultural extension services for dissemination of information and technical assistance for helping farmers increase their productivity based on the majority respondents that agreed and strongly agreed respectively. Foresight, (2011) stated that dissemination of information and technical assistance was an effective strategy for improving access to knowledge and technology. Further, agricultural extension services were a useful tool for helping farmers increase their

productivity, and collaborate with a broader network of farmers and researchers. In a survey conducted by the Global Conference on Agricultural Research for Development (GCARD) 2010, they pointed to the importance of official agricultural extension workers. The general perception however, was that their number was inadequate, especially when measured against the needs of small-scale farm holders, who had limited access to the services they offered, services that represent an important vehicle for the transmission of knowledge, information and training (Lele and others, 2010).

Food production integrates sustainable practices, in particular in the use of natural resources.

Certainly, from the responses, it was concluded that food production in rural areas did not integrate sustainable practices, in particular in the use of natural resources that affected food and nutrition availability. Beddington et al, (2012) said that an increase in food production also required integrating sustainable practices, in particular in the use of natural resources. Many of the current agricultural practices especially in rural areas had relied on cheap energy and abundant water and land, and were a leading source of greenhouse gas emissions. These practices were now proving unsustainable for the environment and health. At the same time, they had led to substantial productivity losses, thereby posing risks to food and nutrition security (Ibid, 2012).

Access to food was ensured when all households and all individuals within those households have sufficient resources to obtain appropriate foods for a nutritious diet.

Table 7 and figure 7 brought data that the researcher wanted to find out from the respondents that access to food was ensured when all households and all individuals within those households had sufficient resources to obtain appropriate foods for a nutritious

diet. It was concluded that the respondents agreed that access to food was ensured when all households and all individuals within those households had sufficient resources to obtain appropriate foods for a nutritious diet. This was supported by FAO, IFAD, UNICEF, WFP, (2019) who stated access was ensured when all households and all individuals within those households had sufficient resources to obtain appropriate foods for a nutritious diet. They further went to say that access to food was dependent on the level of household resources such as capital, labor, and knowledge as well dependent on prices (ibid). Note that adequate access could be achieved without households being self-sufficient in food production but of great importance, was the ability of households to generate sufficient income that, together with own production. Food access also was a function of the physical environment, social environment and policy environment that determined how effectively households were able to access their resources to meet their food security objectives (Martin, 2014). Such that, improving food availability was not sufficient to ensure access to food. Food and nutrition insecurity was more often the result of limited access to food.

All people at all times have physical, social and economic access to food, which is consumed in sufficient quantity and quality.

Whether all people at all times had physical, social and economic access to food that was consumed in sufficient quantity and quality, table 8 and figure 8 illustrated on that raw data. Thus, one of the factors influencing food and nutrition in Chasefu district was that the households all people at all times had no physical, social and economic access to food that was consumed in sufficient quantity and quality. The United Nations, (2012) One of the factors that assured food and nutrition accessibility was the

income capacity of the household. Poverty was obviously a main underlying factor preventing access to food. For instance, when comparing the highest and the lowest income quintiles of the population in developing countries, the poorer children were almost 3 times more likely to be underweight than children in the wealthiest 20 per cent of households and these were found in rural areas.

People have the ability to generate sufficient income which, together with own production, can be used to meet their dietary needs and food preferences.

Based on the data given, it was concluded that people on rural areas had no ability to generate sufficient income that together with their own production could be used to meet their dietary need and food preferences. The Food and Agriculture Organization of the United Nations, (2012) stated that many poor people live in rural areas, it was not surprising that in those areas were the prevalence of undernourishment being higher. Hence, increasing the income level of poor households would help ensure adequate food quantity and quality, and reduce the prevalence of undernourishment. However, in many regions and countries, economic growth had not been inclusive enough to provide employment and income earning opportunities for the poor (United Nations, 2012).

Have appropriate institutional setting so as to increase agricultural investment through women's access to several assets, such as land, input markets and technology

It was concluded that rural areas in Chasefu district did not have appropriate institutional setting so as to increase agricultural investment through women's access to several assets, such as land, input markets and technology. Thus, addressing the issue of food and nutrition accessibility in rural areas necessarily

implied responding to the challenges faced by smallholders. In particular, high inequality in distribution of assets such as land, water, capital, education and health care were a main obstacle that needed to be addressed so as to enhance access to food and nutrition. One of the main obstacles to achieving food security was the lack of access to food, in particular among lower-income groups such as the women that lacked the necessary purchasing power. Food and Agriculture Organization of the United Nations, (2011) stated that an appropriate institutional setting was also crucial for supporting small-scale farming, so as to increase agricultural investment and productivity, while preserving natural resources. Improving women's access, for instance, to several assets, such as land, input markets and technology, increased agricultural production by as much as 2.5 to 4.0 per cent, thereby reducing the number of undernourished people by 12 to 17 per cent, equivalent to freeing 100 million to 150 million people from hunger.

There were information campaigns and educational programmes at household and community level designed to improve health, water and sanitation services.

It was concluded that there were no information campaigns and educational programmes at household and community level designed to improve health, water and sanitation services in rural areas found in Chasefu district aimed at food and nutrition security. This was a contradiction to what Gelli et al., (2015) said that to ensure utilization for food and nutrition security at household level, there was a strong consensus that better nutrition required pro-nutrition policies in other, related sectors such as public policies and programmes designed to improve health; water and sanitation services were of particularly importance.

Resilient food sources refer to those food varieties with the capacity for adaptation to emerging circumstances and may be grown year-round aimed at addressing food and nutrition at household level.

Table 12 and figure 11 sought information on what resilience food sources was. It was concluded that Resilient food sources referred to those food varieties with the capacity for adaptation to emerging circumstances and may be grown year-round within the rural places. Resilience was a somewhat positive concept, as it referred to the capacity for adaptation to emerging circumstances. In this regard, resilient food sources referred to those food varieties with the capacity for adaptation to emerging circumstances and were grown year-round (Tanner, 2010).

Have irrigation programme to improve productivity levels and boost crop yields at household level.

Table 13 and figure 12 above illustrated data on whether rural areas in Chasefu district had irrigation programme to improve productivity levels and boost crop yields. It was therefore concluded bases of the majority responses that disagreed that Chasefu district had no irrigation programme to improve productivity levels and boost crop yields at household level for resilient food sources that contributed to food and nutrition insecurity. IAPRI, (2015) stated that with 67% of the population dependent on agriculture for their income, livelihood and food access, agriculture remained an important sector in Zambia to a point whereby the government had identified the agriculture sector as one of the key priority sectors for economic development and poverty reduction, as highlighted in the Sixth National Development Plan (SNDP) and the National Agriculture Investment Plan (NAIP). By placing emphasis on pro-poor, agricultural-led

economic development, the NAIP placed focuses on small-scale farmers as key actors in the development of agriculture that would promote food and nutrition security at household level through resilient farming processes such as irrigation other than rain driven (Cabral and Norfolk, 2016).

Farmers were adopting conservation farming along with the promotion of resilient crops and new seed varieties

The researcher wanted to find out whether the famers were adopting conservation farming along with the promotion of resilient crops and new seed varieties in Chesufu district. Table 13 and figure 12 above brought out the following data; a frequency of 11 representing 13.8% strongly disagreed, 55 respondents representing 68.8% disagreed, 6 respondents that represented 7.5% were neutral, 6 respondents representing 7.5% agreed and 2 respondents representing 2.5% strongly agreed to the assertion. It was concluded bases on the response rate that the majority disagreed that farmers and household in Chasefu district were not adopting conservation farming along with the promotion of resilient crops and new seed varieties.

Identify an indigenous crop that would be regarded a resilient food source.

Table 14 and figure 13 above sought to identify an indigenous crop that would be regarded a resilient food source for household food and nutrition security. It was concluded that respondents had identified Pawpaw as an indigenous crop that would be regarded a resilient food source. Household food security was differentiated across the farmers, but it was important to note that the majority in rural areas seem not to be food secure. FRA, (2016) stated there was the promotion of soya production that had been driven by agri-business interventions and government policy, aimed at boosting household

income and diversifying diets to ensure food security and nutrition at the local and national level. Alongside promotion of soya beans in rural areas, the government was promoting drought-resistant crops, such as sorghum, to ensure diversification of diets for food and nutrition security. However, the use of herbicides in production systems introduced by new agro-investors had therefore partly contributed to the disappearance of indigenous vegetables and crops that were grown alongside maize and other cash crops (FRA 2016).

VI. CONCLUSION AND RECOMMENDATIONS

This study investigated factors influencing the household Food and Nutrition security in Zambia particularly the rural areas in Chasefu district found in Eastern province. The researcher identified that households in rural areas had above five (5) household member representations that demanded enough and steady availability, access and utilization of food and nutrition. Additionally, there was no expanded use of improved inputs and practices in food production in Chasefu district that was aimed to promote availability for food and nutrition security. Famers did not integrate sustainable farming practices, in particular in the use of natural resources that led to all people at all times not having physical, social and economic access to food that was consumed in sufficient quantity and quality. Households had no irrigation programme to improve productivity levels and boost crop yields for resilient food sources that contributed to food and nutrition security. There were no information campaigns and educational programmes at household and community level designed to improve health, water and sanitation services aimed at food and nutrition security. Based on the study findings, the researchers have made the following recommendations:

Recommendations

- i. Households to embrace the essential dynamics that were core drivers of structural and rural transformation of expanded use of improved inputs and Mechanization in food production.
- ii. Government to provide additional investments in rural infrastructure, including in harvest technologies designed to reduce wastage at the production level.
- iii. Agricultural extension Officers to continuous research on how farmers would integrate sustainable practices, in particular in the use of natural resources that affected food and nutrition availability.
- iv. Government policies need to foster agricultural innovation systems that develop a comprehensive innovation and respond to the double challenge of increasing agricultural productivity while achieving environmental sustainability.
- v. Households to adopt a successful strategy for increasing rural households' income through the diversification of their farming activities.
- vi. Government to provide information campaigns and educational programmes at household level designed to improve health, water and sanitation services.
- vii. Pawpaw propagation to be adopted as an indigenous crop that was a resilient food source for food and nutrition security.

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