SUSTAINABLE FOOD CONSUMPTION AS A CORRELATE OF CIVIL SERVANT HEALTHY LIVING IN EKITI STATE

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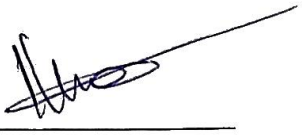
A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION, FACULTY OF EDUCATION, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER (M.Ed.) IN HOME ECONOMICS EDUCATION OF THE UNIVERSITY OF BENIN, BENIN CITY

MAY 2024

CERTIFICATION

We, the undersigned, certify that this research work was carried out by Olayemi OMOSANYIN in the Department of Vocational and Technical Education, Faculty of Education, University of Benin, Benin City.



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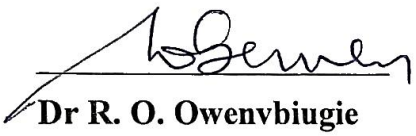

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DEDICATION

This project is dedicated to the Almighty God, the one who helped the researcher through the course of her study.

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ABSTRACT

This study examined sustainable food consumption as correlates of civil servant healthy living in Ekiti State. Seven (7) research questions were raised while five null hypotheses were formulated and tested at 0.05 level of significance.

The correlational survey research design was employed for this study. The population for the study comprised of 3,592,000 civil servants in Ekiti State. A sample size of 399 civil servant from the three senatorial districts in Ekiti State were selected to participates in the study, using a multistage sampling technique. The questionnaire titled "Sustainable food consumption and Healthy Living among Civil Servant Questionnaire" (SEHLCSQ) was developed to elicit information from the respondents. The instrument contained 45 items with a 4- point rating scale made up of four response options of Strongly Agree (SA)=(4), Agree (A)=(3), Disagree (D)=(2) and Strongly Disagree (SD)=(1). The instrument was subjected to content and face validity by the researcher's supervisor and one expert in the department of Vocational and Technical Education and an expert in Psychometrics. A reliability of 0.79 was obtained meaning instrument was high in terms of internal consistency. The researcher directly administered SEHLCSQ to the respondents with the aid of six research assistants. The data collected were analyzed using mean, standard deviation, and independent samples t-test. The null hypothesis 1 was tested using Pearson's Product-Moment Correlation (PPMC), the null hypotheses 2–4 was tested using independent t-test statistics, while null hypothesis 5 was tested using one-way Analysis of Variance (ANOVA).

The major findings were that the extent of sustainable food consumption among civil servants in Ekiti State is high, the extent of healthy living among civil servants in Ekiti State is high, and all the components of sustainable food consumption are positively, moderately and significantly correlated to all the components of health living among the civil servants in Ekiti State. The study concludes that sustainable food consumption is a correlate of health

living among civil servants in Ekiti State across all components. The study recommends that civil servants in Ekiti State especially within the ages of 18-35 should engage in a more sustainable way of eating by choosing locally sourced foods, minimize the use plastic and adopt the use of leaves in packaging foods.

CHAPTER ONE

INTRODUCTION

Background to the Study

Sustainable food consumption has emerged, in recent times, as a popular approach to reducing environmental impact and improving health. This trend is particularly relevant to the lifestyle of civil servants. The lifestyle of civil servants in Nigeria is a matter of growing concern among scholars. Civil servants are regarded as the elites in the society and tend to enjoy a sense of job security that is relatively guaranteed for workers in private establishments and entrepreneurs. Civil servants work under the guidance and supervision of political leaders and elected officials to ensure the effective implementation of government programs and initiatives, with a high expectation of professionalism, dedication, and commitment to public service (Longley 2023). Efforts towards meeting these lofty expectations tends to make them susceptible to routines and habits that may not be healthfully rewarding. One of the aspects of life where the contingencies of civil service take its toll on civil servants is their food consumption pattern.

Civil servants play a crucial role in upholding the functionality of society, the civil service is regarded as an essential workforce that plays a pivotal role in sustaining societal operations serving as the backbone of public service, civil servants are tasked with executing policies, programs, and services that profoundly influence citizens' welfare, however, their personal health and wellness often go unnoticed, resulting in diminished productivity, heightened absenteeism, and increased high cost of healthcare services . However unfavorable eating habits and the absence of sustainable dietary practices significantly contribute to this predicament, amplifying the likelihood of chronic ailments, mental health issues, and diminished job satisfaction, recent studies revealed that civil servants have a

worrisome food consumption pattern. The study of Ihensekhien and Omosanyin (2024) reported that civil servants in Ekiti State consume fats and oils, fruits and vegetables, cereals, and meat at least once a day, while they consume dairy products, legumes, and sugar about three times per week averagely eat only two adequate meals per day and skip lunch. They were also found out to consume carbonated drinks and snacks between meals, though they averagely do not smoke, drink alcohol. A study conducted by Akinmoladun, Oluyede, Femi, Olaitan and Nesamvuni (2021) revealed that civil servants engage in terrible eating habit as they always and usually eat outside the home. Abdulaleem, Fakayode and Adio (2023) reported that non-payment of salaries affected food consumption of civil servant in Ekiti State, which can cause malnutrition, frequent sickness, depression and deteriorated health. An earlier study conducted by Udonwa, Iyam and Inah (2015) highlighted that while civil servants have the opportunity to make better food choice because of their purported exposure, they sometimes practice stress-related eating habits because of the high-pressure nature of their work. In other words, the quantity and quality of food they consumed are affected by factors such as time constraints, availability of pre-packed office lunches, health-conscious choices, budget considerations, need to socialize over meals, and cultural diversity in the workplace. These seemingly adopted lifestyle necessitate the need to explore more sustainable ways of eating among civil servants.

Sustainable food consumption involves consuming diets with low environmental impacts, which contribute to food and nutrition security and to healthy life for present and future generations (Harvard School of Public Health, 2023). Sustainable food consumption refers to consuming food items that promote every aspect of people's health, with low adverse impact on the environment, are affordable and equitably accessible, and are culturally acceptable (Biesbroek, Kok, Tufford, Bloem, Darmon, Drewnowski, Veer (2023). By this definition, sustainable food consumption has about four components, namely, concern over

the health, environmental, economic, and sociocultural impacts of food consumed, as outlined by the Food and Agriculture Organisation (FAO) and World Health Organization (WHO) (2019). The health aspect of sustainable food consumption involves consuming nutritious foods that are minimally processed, balanced across food groups, primarily plant-based and moderately supplemented by animal-based foods, as well as safe and clean water (Fanzo, Drewnowski, Blumberg, Miller, Kraemer, & Kennedy (2020). The environmental aspect of sustainable food consumption involves eating foods that are eco-friendly, produced with minimal use of antibiotic and plastic use, avoiding the use of fertilizers, greenhouse gas emissions and all forms of pollution within established global targets.

The Economic aspect of sustainable food consumption involved consuming food items that are affordable within the purchasing power of a given population. By implication, when people consumed foods without straining their present and future economic potentials, they are eating sustainably. The sociocultural aspect involves consuming foods that are safe for socialisation, equally distributed, culturally acceptable, accessible, and locally-sourced. This aspect of sustainable food consumption leverages on people's regional food knowledge, because food has contextual implications for the healthiness and overall lifestyle of a group of people, both on personal and collective bases. It is arguable that the food consumption pattern of civil servants in Nigeria violate these four aspects of sustainable food consumption, and this may have significant implication for how healthy their lives are.

Healthy living is the perpetual condition of all-round well-being in terms of a person's physical, social, mental, emotional, and spiritual state. The European Food Information Council (EUFIC) (2023) explained that healthy living involves having the opportunity, capability and motivation to act in a way that positively affects your physical and mental well-being. D'Moore (2019) explained that optimal health can only be obtained through the

synergistic interaction of the body and mind. In order words. Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. (WHO 1948), though the definition of health has often been limited to bodily wholeness, and sometimes extended to mental soundness, there are overwhelming evidences in literature that the true definition of good health encompasses the wellness of the physical, psychological, and social parts of any human. In specific terms, physical health includes a person's wellbeing in sensation, energy, physical strength, body functioning, physiological responses and pathological state; while the psychological health includes soundness of cognition, perception, mood, affection, problem-solving ability, memory, willpower, and decision making. Social health is the aspect of well-being that stems from connection and community, such as having close bonds with family and friends, enjoying a sense of belonging to groups, and feeling supported, valued, and loved. Healthy living, therefore, involves the synergy of these three aspects, and there may be a relationship between such a synergy and the observance of the aspects of sustainable food consumption., and this may be true among civil servants.

Eating sustainably may be correlated with healthy living within any population, especially among civil servants. One of the biggest aspirations of the people in the modern societies is maintaining a healthy life. This is the goal of the many people around the world, doctors, and dieticians offers various ways to attain and maintain it. The key to a healthy life, for many, is about raising life quality, a healthy diet, exercise and healthy mental life. Nutrition refers to the processes involved in taking in, assimilating and utilizing nutrients in food for growth, energy, and maintenance (Ihensekhien & Salami, 2016). Good nutrition is usually regarded as varied and diverse sources of nutrients in proportional amounts without overeating. Eating a varied, well-balanced diet means eating a variety of foods from each of the different food groups daily. It also includes eating breakfast daily, choosing meals and

snacks wisely, drinking enough water and other fluids and maintaining a healthy weight. The quality of the food one consumes and the amount of it are also very important. As many would suggest, eating a wide variety of healthy and sustainable foods promotes good health and helps to protect against chronic disease (U.S. Department of Agriculture, 2015). This suggests the relationship between sustainable food consumption and physical health of individuals. However, the association may transcend to the other two aspects of human health.

According to Zanatta, Mari, Adorni, Labra, Matacena, Zenga and D'Addario (2022) reported that psychological aspect of health is associated with lower levels of anxiety, depression, stress symptomatology and higher perceived subjective well-being with healthier-sustainable food consumption behaviors. The study of Rossa-Roccor, Richardson, Murphy and Gadermann (2021) reveals a significant positive association between the junk food component and depression as well as anxiety. Mazhari, Mazhari and Hakimzadeh (2023) also posited that one of the main ways of reforming the society, creating a trend and reviving human nature is the health of the food process from the farm to the table (farm, transportation, product processing, cooking, while eating). These reported forms of relationship between sustainable food consumption and healthy living may apply to every group of people, though there remains a gap in knowledge as to the existence of such relationship among civil servants.

Sociodemographic characteristics of civil servants may influence the relationship between their sustainable food consumption practices and the healthiness of their living. Some of those characteristics that are considered in this study include age, gender, location and socio-economic status. Age refers to the length of time that a person has lived or a thing has existed. It is often measured in years, and it serves as a fundamental concept in various contexts, including biology, sociology, and law. In the context of human development, age is

typically categorized into different stages, such as infancy, childhood, adolescence, adulthood, and old age. Biologically, age is often associated with the number of years an organism has been alive, and it can be indicative of the various life stages and changes that occur over time. In social contexts, age can influence societal expectations, roles, and responsibilities. Legal systems may also use age as a criterion for determining eligibility for certain rights, responsibilities, and privileges, such as voting, driving, or drinking alcohol. Age has been reported to significantly influence food choices, such that older people are more likely to make healthier food choices. They tend to accept foods with nutritional claims in their diet, and to rely only on the ingredients list, which is linked to "specific nutrients" (Nyamragchaa, Kelly, McMahon & Yeatman, 2020). The younger people, on the other hand, tend to pay attention to both specific nutrients and the ingredients list of food labels. This study was concerned with two age groups, early adulthood which comprises civil servants between 18 and 39 years of age, and middle age which comprises civil servants between 40 and 60 years of age. Gender as sociodemographic characteristics of civil servants may also influence the relationship between their sustainable food consumption practices and the healthiness of their living.

Gender refers to the social, cultural, and behavioral attributes, roles, and expectations associated with being male or female. It distinct from biological sex, which is based on the physical and physiological characteristics such as reproductive systems, chromosomes, and hormones. Gender identity is a deeply-held sense of being male, female, or another gender, and may or may not align with the sex assigned at birth (Earp, 2020). Eating behavior self-efficacy is said to have a significantly decreasing moderating effect on gender differences in the adoption of a healthy diet as gender plays an important role in the adoption of a healthy diet. The gender differences between male and female in the adoption of a healthy diet were greatest in the lowest levels of food behavior self-efficacy, even after the adjustment for other

factors that might explain the gender-related variability in the adoption of a healthy diet in their food choice. This study was concerned with two genders only male and female. Geographical location of gender can influence the relationship between sustainable food consumption and healthy living.

Location refers to the specific position or existence of a particular point or object. In geography, the term, “location” hold significance and is generally regarded as more exact than the term “place”. On the other hand, a locality pertains to a human settlement, encompassing cities, towns, villages or even archaeological sites. There seems to be some amount of difference in the consumption pattern of people in rural and urban areas, and this may have a bearing on the relationship between sustainable food consumption and healthy living among civil servants (Akinbode & Akinyemi, 2019). Rural areas often have limited access to processed foods and therefore rely more on sustainable homemade meals than those in urban area. Therefore, consumption pattern of people in rural and urban area may be influenced by their income level.

Income level provides a way to understand the social and economic inequalities that exist in a given population. The income level and purchasing power of civil servants may also influence the relationship between their sustainable food consumption practices and healthy living. The study of Biesalski (2016) reported that economic factors such as income level, availability of resources, and access to markets, influence the types of food consumed, meal planning, and cooking practices. In this study, three income levels were considered – low, middle and high. Following the report of National Bureau of Statistics (2019) that ability to earn/spend $1 per day is the benchmark for poverty, individuals who make below or about ₦420,000 per annum (about ₦1000 per day –less than $1) are regarded as having low-income level; those which income greater than ₦421,000 but less or equal to ₦1,000,000 per annum

(averagely ₦3,000, about $3 per day) are regarded as having middle-income level, while those with income above ₦1,000,000 per annum (averagely ₦2,500, about $ 3 per day) are regarded as having high-income level.

There have been several studies conducted to assess the relationship between sustainable food consumption and healthy living. However, to the researcher's best knowledge, there seems to be paucity of literature on studies determining the relationship between sustainable food consumption and healthy living among civil servants. Hence, this study investigated sustainable food consumption as correlate of civil servant healthy living in Ekiti State.

Statement of the Problem

Civil servants who are responsible for implementing policies and programs that promote health often neglect their own health and wellbeing with unsustainable food consumption practices contributing to increased risk of chronic diseases, reduced work performance and job satisfaction. However, the researcher has observed that the nature of civil servant job combined with limited access to healthy and sustainable food options poses threat to their health. Physically, there are instances of chronic diseases such as emaciation, obesity, osteoporosis, distorted bone, diabetes, migraine among others. Psychologically, many civil servants have been observed to be anxious about insufficient finances and family crisis, and many times some may get depressed. The researcher opines that these forms of unhealthiness may be associated with the observed prevalent unsustainable food consumption practices among civil servants in the state. For instance, the basic diet of Ekiti people is made up of starchy staple foods such as pounded yam, and they often are not balanced with the nutrients needed for optimal health. In the same vein, the diets are observed not to be sustainable in terms of impacts of food consumption on the environment, economic situation

and sociocultural realities around the civil servants. If these situations are not addressed, it may lead to increased risk of certain types of cancer, digestive problem, elevated level of cholesterol, depression, anxiety, inflammation, reduced quality of life, cardiovascular diseases, type 2 diabetes, fatigue, vitamins and minerals deficiency, weakened immune system, impaired cognitive function and so on. Therefore, this study assessed the relationship between sustainable food consumption and healthy living among civil servants in Ekiti State.

Purpose of the Study

The main purpose of the study is to investigate the relationship between sustainable food consumption and healthy living among civil servants in Ekiti State. Specifically, the study determined:

1. the prevalent dietary pattern among civil servants in Ekiti State,
2. the extent of sustainable food consumption among civil servants in Ekiti State, based on the health, environmental, economic and sociocultural impacts on such eating,
3. the extent of healthy living of civil servants in Ekiti State in terms of their physical, psychological and social health,
4. the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State,
5. the difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on gender,
6. the difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on location, and
7. the difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on income level.

Research Questions

The following research questions were raised to guide the study.

1. What is the prevalent dietary pattern of civil servants in Ekiti State
2. What is the extent of sustainable food consumption among civil servants in Ekiti State, based on the health, environmental, economic and sociocultural impacts on such eating?
3. What is the extent of healthy living of civil servants in Ekiti State in terms of their physical, psychological and social health?
4. What is the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State?
5. What is the difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on gender?
6. What is the difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on location?
7. What is the difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on income level?

Research Hypotheses

Research Questions 4 – 7 were hypothesized and were tested at 0.05 level of significance.

1. There is no significant relationship between sustainable food consumption and healthy living of civil servants in Ekiti State.
2. There is no significant difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on age.
3. There is no significant difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on gender.
4. There is no significant difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on location.

5. There is no significant difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on income level.

Significance of the Study

The findings of this study when published in a reputable academic journal, books, presented in conferences, the findings of this study would be beneficial to civil servants, meal planners, home economists, food-processing companies, Food Regulatory Agencies, Government at all levels and future researchers.

The findings of this study will be of immense benefit to civil servants in Ekiti State, as it will provide basis for understanding the essence of sustainable food consumption habit with respect to ensuring their heathy living. The study will help them in adopting proper way in improving their overall health and wellbeing, reducing the risk of chronic diseases, improve food safety and ensure proper nutrition in their respective families.

Home Economists will find the information provided by this study useful as insights into the extent to which the eating habits of civil servants are sustainable, and the relationship that has with the healthiness of their living. This will enable practitioners in Home Economics to design and deliver community nutrition education programmes that are targeted at civil servants.

Meal planners will find the information provided by this study useful as it will give them an insight on how to create meal plans that contribute to overall health and well-being, considering factors like heart health, weight management, and disease prevention.

Food-processing companies will find the information provided by this study useful as it will give an insight on the negative effect of unsustainable methods of processing food such as the use of artificial addictives, burning of fossil fuel, use of plastic and so on.

Food Regulatory Agencies in Nigeria will benefit from the research work as it will give them a technical aid in formulating policies that will ensure healthy nutrition and protect consumers from food contamination due to unhygienic way of handling food by the producers and middlemen.

Local Food Producers will benefit from this study as it will encourage them to support local agricultural practices and food systems, boosting the local economy and promoting food security

Future Generations will benefit from this study as civil servants will set examples of adopting a culture of sustainable food consumption.

Government at all levels will also benefit from the study, especially the Ministry of Agriculture and National Orientation Agency as this research work may propel them to work in synergy with farmers in ensuring availability of healthy food and safety equipment that could be used in food industry for hygienic purposes in sustainable manners.

Finally, the findings of this study will serve as a contribution to literature for any researcher who may be interested in investigating the relationship between sustainable food consumption and healthy living. The findings of this study will serve as empirical evidence for or against such study being conducted.

Scope and Delimitation of the Study

The study covered relationship between sustainable food consumption and healthy living. The study covered sustainable food consumption, healthy living, relationship between sustainable food consumption and healthy living, and influence of demographic (age, income, gender and socio economics status) characteristics on sustainable food consumption and healthy living. In terms of population, this study was delimited to civil servants in Ado, Ikere, and Ido/Osi local Govt area of Ekiti State of Nigeria.

Definition of Terms

The following terms are operationally defined;

- **Civil servants**: They are elites in the society and tend to enjoy a sense of job security that is not relatively guaranteed for workers in private establishments and entrepreneurs.
- **Eating Habit:** This is conscious, collective and repetitive behaviours, which lead people to select, consume, and use certain foods or diets, in response to social and cultural influences.
- **Eco-friendly:** This means environmentally friendly. When it comes to products, that means everything from production to packaging needs to be considered safe for the environment.
- **Healthy Living:** This means maintaining a healthy lifestyle and introducing habits that improve people's health such that both physical and mental health are in balance or functioning well together.
- **Nutrition:** This is a critical part of health and development. Better nutrition is related to improved and stronger immune systems, as well as study of nutrient in food, how the body uses them, and the relationship between diet, health and disease.
- **Sustainable:** Able to continue over a period of time.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

The review of related literature was reviewed under the following sub-headings:

- Theoretical Framework
- Concept of Sustainable Food Consumption
- Concept of Healthy Living
- Concept of Civil Servants
- Relationship between Sustainable Food Consumption and Healthy Living of Civil Servants
- Influence of Demographic Characteristics on Sustainable food consumption and Healthy Living
- Review of Related Empirical Studies
- Summary of Literature Reviewed

Theoretical Framework

Sustainability Theory

This study is hinged on the Sustainability Theory put forward by Graham Harlem Brundtland (1987). The theory emanated from the report submitted by her committee to the World Commission on Environment and Development held in Norway. Most significantly, the report defined sustainability as being able to meets the needs of the present without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development, WCED, 1987). This definition gave rise to the notion of sustainable development which was also described in the report, and is the basis for the formulation of the 17 Sustainable Development Goals (SDGs) of the United Nations. Subsequently, sustainability theory has been applied in several aspects of scientific and

humanistic endeavours, such as the concept of Sustainable Food Systems (SFS) that is closely related to the present study.

The concept of Sustainable Food Systems provides a robust framework for scientific inquiry into the intricate connections between sustainable food consumption practices and overall health and well-being. This theoretical lens integrates ecological (or environmental), economic, social, and nutritional dimensions, offering a comprehensive understanding of how food choices influence personal health within the context of broader sustainability goals.

Food and Agriculture Organisation of the United Nations (FAO-UN, 2018) described the sustainable food system (SFS) as a food system that delivers food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised. This means that that such system is profitable throughout (economic sustainability); has broad-based benefits for society (social sustainability); and has a positive or neutral impact on the natural environment (environmental sustainability). This is described diagrammatically in Figure 1.

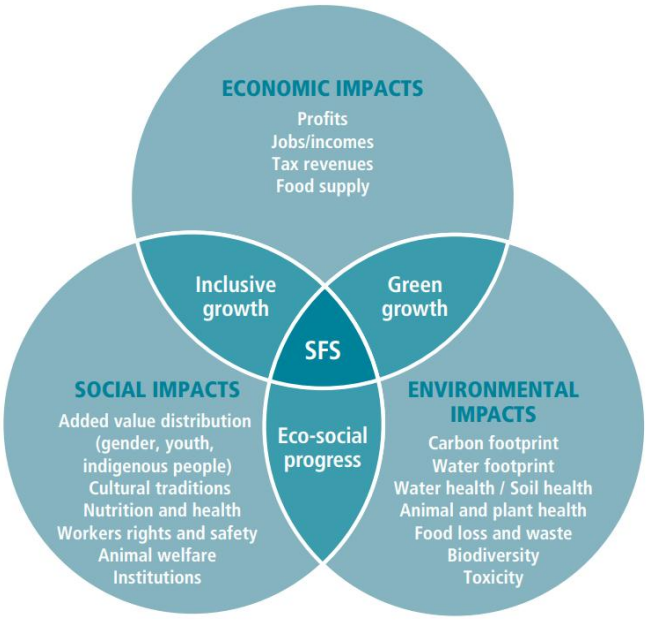

Figure 1: Sustainability in Food Systems

Source: FAO-UN (2014)

The concept of sustainable food systems has evolved over several decades, shaped by environmental, social, and economic concerns. The emergence of environmental movements in the 1960s and 1970s, including the publication of Rachel Carson's "Silent Spring" in 1962, raised awareness about the environmental impacts of industrial agriculture. This laid the groundwork for discussions on more sustainable and ecologically friendly food production. Afterwards, the organic farming movement gained momentum between the 1970s and 1980s, driven by concerns about synthetic pesticides and fertilizers. Advocates argued for more sustainable farming practices, emphasizing the use of natural inputs and ecological balance. Sequel to this, the term "sustainable agriculture" gained prominence in the 1980s while the international discussions on global food security and the environmental impact of agriculture gained traction in the 1990s. The 2000s witnessed a growing focus on the importance of biodiversity in maintaining resilient food systems. In the 2010s, increasing awareness of climate change impacts on agriculture led to a renewed emphasis on sustainable practices. The United Nations Sustainable Development Goals (SDGs) adopted in 2015 included goals related to food security, sustainable agriculture, and responsible consumption. Most recently, the integration of various sustainability principles into a comprehensive theory of sustainable food systems gained prominence in the last decade. This holistic approach considers ecological, social, and economic factors, recognizing the need for an interconnected and resilient food system.

According to OpenAI (2024), the key components of the SFS include ecological sustainability, social dynamics, and nutritional health, as well as a fourth component which is economy friendliness. Ecological sustainability explains how sustainable food consumption practicessuch as plant-based diets or locally sourced foods, contribute to reduced environmental impact, while social dynamics investigates the social aspects of sustainable food consumption, considering factors such as cultural preferences, community engagement,

and equity in food access. The component of nutritional health focuses on the nutritional quality of sustainably sourced and produced foods, while the economy friendliness component examines the extent to which food items consumed are affordable within the purchasing power of a given population.

Application of Sustainability Theory in the Present Study

Sustainability theory is applied in this study by exploring the components of sustainable food systems and their relationship with healthy living of civil servants in Ekiti State. The present study applied the component of ecological sustainability by exploring the ecological footprint of different diets through survey of civil servants and the implications it has for environmental health. In the same vein, how social dimensions influence the adoption of sustainable food consumption habits and their impact on health as a form of exploring social dynamics component of SFS theory. This present research may analyze the health outcomes associated with diverse diets, including the potential benefits of nutrient-dense, environmentally friendly food choices, and at the same time investigate the way people consumed foods without straining their present and future economic potentials.

Food and Agriculture Organization of the United Nations (UN-FAO) and World Health Organization (WHO) (2019) listed the specific applicability of the SFS Theory, as is intended in the present study. They highlighted the aims of sustainable healthy diets which are dietary patterns that promote all dimensions of individuals' health and wellbeing; have low environmental pressure and impact; are accessible, affordable, safe and equitable; and are culturally acceptable. The aims are to achieve optimal growth and development of all individuals and support functioning and physical, mental, and social wellbeing at all life stages for present and future generations; contribute to preventing all forms of malnutrition (that is, undernutrition, micronutrient deficiency, overweight and obesity); reduce the risk of

diet-related NCDs; and support the preservation of biodiversity and planetary health. By using the term 'sustainable healthy diets', the aims advanced by UN-FAO and WHO (2019) harnessed the constructs of the two major variables in the present study namely sustainable food consumption and healthy living, making the theory highly suitable.

Critique of Sustainability Theory

Zahedi (2019) highlighted some of the major criticisms posed against sustainability theory. Some scholars claimed that the theory lacks strong theoretical foundations, conceptual clarity (such as the precise definition of the needs of the next generation), and legal enforcement guarantees. However, since the theory became adopted and expanded by the United Nations (UN), many of these claims no longer hold true. The theory has universal acceptance and applicability in all the member states of the UN, including Nigeria. Another criticism was also raised by Vaezzadeh (2014) that sustainability theory is one-dimensional and disproportionate with the needs of developing countries. This is similar to the claim that the theory lacks logical justification and moral obligation with regard to ignoring the rights of today's generation while emphasizing on the needs of the next generation. These charges of presumed bias in the theory predates its universal adoption, and there are evidences that the United Nations is proactive about ensuring equity among every person on earth (United Nations, 2015).

Sustainability theory is, therefore, relevant for use as a theoretical framework in a scientific study on the relationship between sustainable food consumption and healthy living among civil servants in Ekiti State, as it enabled a comprehensive exploration of ecological, social, and nutritional dimensions. This approach contributes valuable insights to support healthier individuals and communities while advancing sustainability goals in the food system.

Concept of Sustainable Food Consumption

Sustainable food consumption involves consuming food that has a low environmental impact. It's largely plant-based and can help reduce greenhouse gas emissions, pollution, and chronic diseases in humans. Sustainable food production won't happen overnight, and much of the impact comes from systems, not people (Vermeir, Weijters, De Houwer, Geuens, Van, Desteir & Verbeke 2020). Sustainable food consumption means choosing foods based on the impact of their production on soil, water consumption, pesticides, land clearing, greenhouse gasses, and fossil fuel usage. People who try to eat sustainably choose foods that are produced by farming practices that are the least harmful and the most beneficial to the environment. Choosing to eat sustainably doesn't just have an environmental impact. It's also widely recognized as more nutritious than a conventional diet (Biesbroek, Kok, Tufford, Bloem, Darmon, Drewnowski, Fan, Fanzo, Gordon, Hu, Lähteenmäki, Nnam, Ridoutt, Rivera, Swinburn, & Veer (2023).

Sustainability is defined by the ability to meet the needs of the present without compromising the ability of future generations to meet their needs in a way that balances environmental, economic, and social aspects (Brundtland et a, 1987; UNGA, 2005). The UN has also outlined a 2030 agenda for sustainable development in their 17 Sustainable Development Goals (SDGs) that present global goals for a thriving population and planet in peace and prosperity (UNSDGs, 2015).

Many definitions of sustainable diets have been put forward. According to El Bilali, Strassner & Hassen, (2021). definition, a sustainable diet is one that "promote(s) environmental and economic stability through low-impact and affordable, accessible foods,

while supporting public health through adequate nutrition" in a way that engenders "sovereignty and preserve(s) tradition involving culturally sensitive and acceptable foods" (El Bilali, *et al* 2021)). For this thesis, the definition complied by the UN FAO and Biodiversity International were used. They define sustainable diets as "those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources" (Rastogi, Mayuri, Akansha, Rikhari, Aditi, Shaida, Bushra, Islam & Zoobiya. (2023).

Though early recommendations to include sustainability in nutrition guidelines had been made in the mid-1980s, according to Gussow (1999) there had been a "lukewarm response (to that recommendation) not only from the public but from a large number of nutrition educators" more than a decade later. Recently, it has been more widely accepted that diets impact the environment and dietary change can be a main driver of the sustainability of the food system (Fanzo, Bellows, Spiker, Thorne-Lyman, & Bloem (2021).; Willett et al., 2019;). Yet, despite the growing acknowledgement by public health scholars and practitioners of the need for changes in public health practice to include sustainability considerations (Willett et al., 2019), there is a lack of understanding of how public health policies include sustainability and how policy makers consider sustainability in FBDG development (James-Martin, Baird, Hendrie, Bogard, Anastasiou, Brooker, Wiggins, Williams, Herrero, Lawrence, Lee, & Riley (2022) Note, the term 'eater' is used in this study, which was adopted from Dietitians of Canada's response to Health Canada's consultation on dietary guidance policy (Dietitians of Canada, 2017). 'Eater' is used as opposed to 'consumer,' as eater implies broader values of diets beyond physical (i.e., consumption of nutrients and foods) and economic health (i.e., buying, selling, livelihoods) to encompass the

social and environmental health of sustaining people and the planet (Dietitians of Canada, 2017).

According to Rastogi *et al* (2023), a sustainable diet consists mainly of vegetables, legumes, whole grains, certain nuts, and fruits. It avoids most processed foods such as sugar and refined grains. Eating sustainably can include meat and fish that are grown and harvested in environmentally conscious ways. However, red meat, primarily beef, is not considered sustainable, since it contributes heavily to methane emissions and land deforestation. Dairy farming is also considered unsustainable due to methane emissions. Eating sustainably is less expensive than a diet rich in meat, since legumes and grains are less costly to produce than livestock and require fewer resources. These foods are high in nutrients. They can help people avoid chronic illnesses such as high blood pressure, which has been linked to a diet high in red meat and processed foods.

Poor diets are a major contributory factor to the rising prevalence of malnutrition in all its forms. Moreover, unhealthy diets and malnutrition are among the top ten risk factors contributing to the global burden of disease. The State of Food Security and Nutrition in the World Report (SOFI 2019) shows that the number of the undernourished has been slowly increasing for several years in a row, and at the same time the number of overweight and obese people all over the world is increasing at an alarming rate.

According to World Health Organization WHO (2020), More than 820 million people go to bed hungry every night. In 2018, 1.3 billion people experienced food insecurity at moderate levels, meaning they did not have regular access to nutritious and sufficient food. Overweight and obesity and their associated diet-related non communicable diseases (NCDs) are contributing to 4 million deaths globally. Today, 2 billion adults and over 40 million

children under five are overweight. Moreover, over 670 million adults and 120 million girls and boys (5-19 years) are obese (WHO, 2020).

Malnutrition is costly to the health of individuals, their wellbeing and productivity. It also has high socio-economic costs for societies in all regions of the world. While the causes of malnutrition around the world are complex, unhealthy diets remain one of the main contributors to the global burden of disease. Unhealthy diets were identified as the second-leading risk factor for deaths and disability-adjusted life-years (DALYs) globally in 2016 (GBD Diet Collaborators 2019) while in 2017 they accounted for approximately 11 million deaths and 255 million DALYs (Callejon, 2018). To address malnutrition, diets must improve. However, the task is challenging, as drivers to changing diets are numerous and include urbanization, globalization of agricultural markets and trade, incomes, supermarket penetration and mass food marketing. Thus, to improve diets, the entire food system – which encompasses the range of actors (and institutions) involved in the production, aggregation, processing and packaging, distribution, marketing, consumption and disposal of food products – must be considered.

According to UN-FAO (2019), adopting sustainable food consumption habits means taking a well-rounded approach to food. Besides being mindful of how food is produced, it's important to take food storage and food waste into consideration. It can mean being adventurous about trying new foods and new recipes. Daily meals may require more thought and meal prep until the habit becomes ingrained. Successfully transitioning to a sustainable diet can be a long process, but it doesn't have to be a difficult one. Not every change will work for a particular individual. Food choices are intensely personal. Food allergies and intolerances will impact sustainable options.

Sustainable healthy diets according to Harrison, Palma, Buendia, Bueno-Tarodo, Quell, & Hachem (2021) are dietary patterns that promote all dimensions of individuals' health and wellbeing; have low environmental pressure and impact; are accessible, affordable, safe and equitable; and are culturally acceptable. The aims of Sustainable Healthy Diets and eating are to achieve optimal growth and development of all individuals and support functioning and physical, mental, and social wellbeing at all life stages for present and future generations; contribute to preventing all forms of malnutrition (i.e. undernutrition, micronutrient deficiency, overweight and obesity); reduce the risk of diet-related Non-Communicable Diseases (NDCs); and support the preservation of biodiversity and planetary health. Sustainable healthy diets must combine all the dimensions of sustainability to avoid unintended consequences.

Food and Agriculture Organization of the United Nations (UN-FAO) AND World Health Organization (WHO) (2019) highlighted the descriptions of sustainable healthy diets from the perspectives of their health, environmental and sociocultural impacts. With regards to health impact, sustainable healthy diets…

- start early in life with early initiation of breastfeeding, exclusive breastfeeding until six months of age, and continued breastfeeding until two years and beyond, combined with appropriate complementary feeding.
- are based on a great variety of unprocessed or minimally processed foods, balanced across food groups, while restricting highly processed food and drink products.
- include wholegrains, legumes, nuts and an abundance and variety of fruits and vegetables.
- can include moderate amounts of eggs, dairy, poultry and fish; and small amounts of red meats.
- include safe and clean drinking water as the fluid of choice

- are adequate (i.e. reaching but not exceeding needs) in energy and nutrients for growth and development, and to meet the needs for an active and healthy life across the lifecycle.
- are consistent with WHO guidelines to reduce the risk of diet related NCDs, and ensure health and wellbeing for the general population.
- contain minimal levels, or none, if possible, of pathogens, toxins and other agents that can cause foodborne disease.

With regards to environmental impact, sustainable healthy diets…

- maintain greenhouse gas emissions, water and land use, nitrogen and phosphorus application and chemical pollution within set targets.
- preserve biodiversity, including that of crops, livestock, forest-derived foods and aquatic genetic resources, and avoid overfishing and overhunting.
- minimize the use of antibiotics and hormones in food production.
- minimize the use of plastics and derivatives in food packaging.
- reduce food loss and waste.

With regards to sociocultural impact, sustainable healthy diets…

- are built on and respect local culture, culinary practices, knowledge and consumption patterns, and values on the way food is sourced, produced and consumed.
- are accessible and desirable.
- avoid adverse gender-related impacts, especially with regard to time allocation (e.g. for buying and preparing food, water and fuel acquisition).

Sustainability in Diets

The current condition of the global food system has serious implications for jeopardizing future agricultural production, poses wide-ranging detrimental impacts on

ecosystems, and is failing to adequately nourish the global population (El Bilali, Strassner, & Ben Hassen (2021). Worldwide, agriculture is facing cropland degradation from intensification and causing simultaneous biodiversity loss (El Bilali, *et al* (2021). Hunger and malnutrition afflict nations around the globe yet obesity prevalence is also on the rise, associated with unhealthy transitions in diets towards market driven, obesogenic foods (e.g. fast foods, sugar sweetened beverages) (Laar, Addo, Aryeetey, Agyemang, Zotor, Asiki, Rampalli, Amevinya, Tandoh, Nanema, Adjei, Laar, Mensah, Laryea, Sellen, Vandevijvere, Turner, Osei-Kwasi, Spires, Blake, Holdsworth 2022)

According to the United Nations nutrition and environment experts, in order to address the myriad environmental, social, and health challenges both caused by and affecting food systems, a shift towards healthy and environmentally responsible dietary patterns is needed within global populations (Willett, Rockstrom, Loken, Springmann, Lang & Vermeulen 2019). Human dietary practices impact the environment and have implications for food system sustainability (Willett *et al* 2019). Trends in global food demand are estimated to increase by 100-110% by 2050 to keep up with predicted population growth and shifting consumption toward more animal products associated with increased wealth (Fanzo *et al.,* 2021).

Increased demand for crops could require one billion additional hectares of land cleared and emit greenhouse gas (GHG) equivalent levels exceeding three gigatons per year if land continues to be cleared in poor nations for agricultural expansion by rich nations (Fanzo *et al.,* 2021). Reducing agricultural crop demand through sustainable dietary practices could reduce land clearing, water use, and associated species extinctions (Fanzo *et al.,* 2021). Sustainable diets can offer health benefits while lowering global GHG emissions and excess nitrogen pollution in the environment (Fanzo *et al.,* 2021; Willett et al., 2019).

Diets, the environment, and health are a tightly linked 'trilemma' presenting a global challenge as well as an opportunity for improvements in environment and public health (Wyckhuys, Aebi, Bijleveld van Lexmond, Bojaca, Bonmatin, Furlan, Guerrero, Mai, Pham, Sanchez-Bayo, & Ikenaka 2020). Dietary practices with low environmental impact have been associated with beneficial health outcomes (Fresán, Craig, Martínez-González & Bes-Rastrollo (2020). For example, diets lower in animal-based food products are linked with lower GHG emissions, less water and land use, and reduced all-cause mortality risk compared to high animal-based diets (Gibbs, J., & Cappuccio, F. P. (2022).

Semi-vegetarian (less than one animal-based food consumed in a week) and vegetarian diets are lower in total emissions estimated through food product life cycle analysis of diets (including food production, processing, transportation, storage, retail, and consumption, and disposal) and are associated with a lower risk of all-cause mortality when compared to non-vegetarian diets (Kustar, A., & Patino-Echeverri, D. (2021). Though, an environmentally conscious diet does not necessarily mean it is also healthy (Macdiarmid, 2013).

One step that federal governments can take in ecofriendly consumption and supporting sustainable, healthy futures is to produce and circulate food based dietary guidelines (FBDG) that include sustainability principles. Given the mounting evidence of the need for health- and environment-related changes in food and nutrition practices the FAO has made international recommendations for governments to act by publishing FBDG that incorporate sustainability in 2016 (Gonzalez et al, 2016).

Many governments already create dietary guidelines that can be the basis for action in healthy eating and act as the foundation for policy and institutional change, yet their FBDG may be further employed to benefit the environment and greater sustainability concerns

(Willett et al., 2019). The recent consensus of the global EAT-Lancet Commission is that "dietary guidelines that integrate health and environmental sustainability considerations could be one tool for nutrition education" and recommend that "releDoorent national bodies should implement guidelines for healthy diets from sustainable food systems" (Willett et al., 2019). Yet few countries have positioned sustainability in their food-related public polices (e.g. dietary guidelines) as a signal of their sustainability commitments (Gonzalez et al., 2016)

Global Concern over Sustainable Food Consumption

Concerns with nutrition have changed over time. In 1934, Argentine physician and nutrition expert Pedro Escudero recommended that a healthy diet was one that was qualitatively complete, quantitatively sufficient, harmonious in its composition and adequate for its purpose and the individual (Escudero, 1934) (Martinelli & Cavalli (2019). For a long time, concerns with nutrition have focused on the consumption of large amounts of foods that are high in sugar, sodium and fat. These concerns are pertinent, as consuming large amounts of such foods, combined with factors such as stress and sedentary lifestyles, is related to the incidence of Non-Communicable Chronic Diseases (NCCD), which in recent years have accounted for high mortality rates among the population (WHO, 2015). In light of these trends, the World Health Organization (WHO) has made recommendations in the form of a Global Strategy on Diet, Physical Activity and Health (DPAS) (WHO, 2004).

Unhealthy eating has been identified by the World Health Organization (WHO) as a significant risk factor for non-communicable diseases (NCDs) including cancer, cardio-metabolic diseases and obesity (WHO, 2016). A Lancet report indicated strong links between poor diet and mortality, accounting for 1 in 5 deaths globally (Afshin, Sur, Fay, & Cornaby, 2019). In 2015, NCDs accounted for 40 million deaths worldwide, 80% of which could be prevented (WHO, 2016).

A healthy or eco-friendly diet is usually defined as a diet that is high in plant-based foods such as whole grains, fruits, vegetables, nuts, legumes, and fish and low in high-fat and processed animal-based food (Organization, 2019). Basic principles of healthy eating include variety, caloric control, reduced salt, sugars, saturated and trans-fats consumption. Despite the large amount of research on factors influencing healthy eating, only small improvements in health diet are observed at the population level worldwide (Gonzalez et al., 2016). Furthermore, the dynamic interaction between these factors and sustained effects are poorly understood. Understanding the factors influencing the adoption of a healthy diet and their dynamic relationships is essential to promote health and prevent diseases.

The inter-relations between the factors influencing the adoption of a healthy diet are complex. Recently, the use of computational models to simulate the effect and interactions of factors influencing health outcomes- such as the adoption of a healthy diet- has received growing attention. For example, there is an increased interest in applying agent-based model (ABMs) better to understand complex public health matters (Tracy, Cedar & Keyes, 2018). The use of ABM allows a holistic understanding of dynamic interactions between factors at different levels (i.e., personal, behavioural, social, economic, and environmental factors) (Tracy, et al., 2018). ABM has been applied to public health to understand the multiple drivers of population patterns of health behaviours related to the risk of NCDs such as smoking cessation, alcohol drinking (Li, Ho, Chung, Cheung, Xia, & Song 2022), and physical activity There are several other ABMs that have addressed the issue of a healthy diet But limited number of them provide a conceptual framework for their study. So, it is needed to a developable conceptual framework in the context of a healthy diet and food system, especially in Nigeria.

It is worth highlighting that Escudero's recommendations made in 1934 were ratified by the Global Strategy and remain redolent for the nutritional quality of food

consumed. However, it is also undeniable that we must incorporate requirements related to food production and processing that, at the time, were unnecessary. Changes in our food system are recent, yet the social, economic and environmental damages it causes are growing. The food system is a set of processes that include agriculture, animal husbandry, food production, processing, distribution, supply, marketing, preparation and consumption of food and beverages (Nordhagen, Lambertini, Smith DeWaal, McClafferty, & Neufeld, 2022). In our approach to food systems, we must consider all of the determinants of food consumption, based on the relationship between the different players in the chain: producers, distributors and consumers.

The contemporary diet is no longer sustainable as it is made up of foods whose production is energy intensive and has an impact on the environment, requiring vast tracts of land, which could exacerbate other problems related to food production and supply (Giller, Delaune & Silva 2021). Recommendations for a healthy diet should therefore include sustainability as a key dimension. Healthy foods should be part of a food system that is economically viable, environmentally sustainable and socially fair or, in other words, a sustainable diet.

Sustainable diet or sustainable nutrition are not new terms, however there is no widely used definition for them. They were described for the first time in 1986 by Gussow and Clancy (Gussow, 1986) as a diet made up of foods that are not only healthy, but that also contribute to the sustainability of the entire nutrition system. The complexity of a sustainable diet was demonstrated by the United Nations Food and Agriculture Organization (FAO) in 2010. Sustainable diets are defined as those with “low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally

acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources" (Anselmo 2023).

Despite the scope of sustainable diet dimensions, surveys have generally focused on environmental impact, in particular climate and GHG emission (Nordic Council of Ministers, 2014). The quantitative analysis techniques that are often used, such as life-cycle analysis (Del, Gallo & Strazza 2014; Cerutti, Contu, Beccaro, Ardente & Donno 2016) focus only on the environmental aspects, and ignore the social and economic elements.

Based on this premise, one can have a low GHG diet that is not healthy, or a healthy diet with high levels of GHG emissions (Reynolds, Horgan, Whybrow & Macdiarmid 2019). If we look at the bigger picture, lower environmental impact food is not necessarily more sustainable (broadly speaking) than other foods, if these damage society. For example, environmental efficiency may be reached by large-scale production, but when food is produced on a smaller scale it may support small producers and support local development (Woodhill, Kishore, Njuki, Jones & Hasnain (2022)

International Action for Sustainable Diets

The UN FAO is placing increasing emphasis on establishing healthy and sustainable food systems catalyzed by changes in dietary patterns (Gonzalez et al., 2016; WHO, 1996). The basis of many international sustainability initiatives, the UN released their Sustainable Development Goals in 2015, of which the majority of the goals can be tied to sustainable dietary consumption practices (UNSDGs, 2015). The UN also declared the period between 2016 and 2025, the Decade of Action on Nutrition (WHO, 2017).

International recommendations for country-level action towards sustainable dietary practices have centered on developing policies and guidelines. Prior to the Sustainable Development Goals, and as early as 1996, the UN and World Health Organization (WHO)

suggested that countries consider the question "are the guidelines environmentally sustainable?" when preparing food-based dietary guidelines (WHO, 2017). In the 2014 Rome Declaration on Nutrition, UN member countries committed to "enhance sustainable food systems by developing public policies from production to consumption and across releDoorent sectors to provide year-round access to food that meets peoples' nutrition and promotes safe and diversified healthy diets" (UN FAO, 2014). UN countries, as signatories of the Declaration, aim to move forward by producing and disseminating food policies that include health and sustainability considerations for producers and eaters. Countries party to the 2014 Rome Declaration have pledged to implement public policy with both sustainability and health considered, yet few countries have positioned sustainability in their food-related public polices (e.g. dietary guidelines) as a signal of their sustainability commitments (Gonzalez, 2016).

Eco-Friendly Eating as a Form of Sustainable Food Consumption

Unhealthy eating has been identified by the World Health Organization (WHO) as a significant risk factor for non-communicable diseases (NCDs) including cancer, cardio-metabolic diseases and obesity (WHO, 2016). A Lancet report indicated strong links between poor diet and mortality, accounting for 1 in 5 deaths globally (Afshin, Sur, Fay, & Cornaby, 2019). In 2015, NCDs accounted for 40 million deaths worldwide, 80% of which could be prevented (WHO, 2016).

A healthy or eco-friendly diet is usually defined as a diet that is high in plant-based foods such as whole grains, fruits, vegetables, nuts, legumes, and fish and low in high-fat and processed animal-based food (Organization, 2019). Basic principles of healthy eating include variety, caloric control, reduced salt, sugars, saturated and trans-fats consumption. Despite the large amount of research on factors influencing healthy eating, only small improvements

in health diet are observed at the population level worldwide (Gonzalez et al., 2016). Furthermore, the dynamic interaction between these factors and sustained effects are poorly understood. Understanding the factors influencing the adoption of a healthy diet and their dynamic relationships is essential to promote health and prevent diseases.

The inter-relations between the factors influencing the adoption of a healthy diet are complex. Recently, the use of computational models to simulate the effect and interactions of factors influencing health outcomes- such as the adoption of a healthy diet- has received growing attention. For example, there is an increased interest in applying agent-based model (ABMs) better to understand complex public health matters (Tracy *et al* 2018). The use of ABM allows a holistic understanding of dynamic interactions between factors at different levels (i.e., personal, behavioural, social, economic, and environmental factors) (Tracy*, et al*., 2018).

Agent Based Model has been applied to public health to understand the multiple drivers of population patterns of health behaviours related to the risk of NCDs such as smoking cessation (Li, Ho, Chung, Cheung, Xia & Song 2022), and physical activity (Garcia, et al., 2018). There are several other ABMs that have addressed the issue of a healthy diet (Beheshti, Sukthankar, Igusa, & Jones-Smith, 2016; Langellier, 2016). But limited number of them provide a conceptual framework for their study. So, it is needed to a developable conceptual framework in the context of a healthy diet and food system, especially in Nigeria.

Agriculture and Food System in Nigeria

Agriculture and food systems in Nigeria face key challenges. They need to simultaneously provide sufficient food for all, improve incomes and productivity for small-scale producers, make diets healthier and more affordable, reduce greenhouse gas (GHG) emissions, and build capacities needed to adapt to climate change. However, in the past few

years, as a result of internal conflict, low oil prices, an economic slowdown, COVID-19, and now rising food and fertilizer prices, made worse by the Russian invasion of Ukraine, hunger and poverty have been rising steeply, healthy diets are unattainable for most people, and the impacts of climate change are experienced more frequently and severely.

Hunger and poverty are projected to keep rising until 2030. Even among those who do get enough calories, many will be malnourished due, in part, to the unaffordability of diets that both provide sufficient calories and satisfy the complex nutritional requirements of human bodies. The demographic dynamics in Nigeria will continue to exacerbate these challenges, with the population expected to grow from 206 million people in 2020 to 263 million people in 2030 (United Nations, 2019).

As the population and incomes grow in Nigeria, so too will demand for food and more diversity in food choices, which will exacerbate environmental challenges. At the same time, Nigeria is home to some of the global public goods that are needed to address climate change, preserve biodiversity, and achieve the United Nations Sustainable Development Goals (SDGs). Transforming food systems to deliver on hunger, poverty, healthy diets, and climate change, as well as other challenges while safeguarding global public goods will require significant efforts and resources and therefore global solidarity—in other words, more external aid.

Nigeria's Food System Challenge

This section provides an overview of the recent trends for key aspects of the food system in Nigeria to 2030. Specifically, it focuses on the prevalence of extreme poverty and hunger, the prevalence of the unaffordability of healthier diets, and dietary composition. It also pays attention to the contributions of agriculture to climate change, mostly due to the GHG emissions intensity of the sector, deforestation, and water withdrawal, as well as efforts

to improve resilience and farmers' capacities to adapt to climate change, as described in the country's policy documents.

Critical for agriculture and food systems in the country, Nigeria is the 14th largest country in Africa by land area, with the continent's largest population, estimated at just over 200 million (World Bank Development Research Group, 2021). Two-fifths of the population (43.7%) is under 15 years old (World Bank Development Research Group, 2021). The UN predicts that the country's population will grow from 206 million in 2020 to 263 million by 2030 (United Nations, 2019). The country's climate ranges from hot, arid desert in the north to tropical rainforest along part of the coast in the south, but the tropical savanna climate prevails.

Nigeria's economy strongly relies, directly or indirectly, on oil production and exports. The share of agricultural contribution to GDP in 2020 stood at 23.4%—up from 21.9% in 2019, with the highest contributions documented in 2002 (37%) (World Bank Data Portal, 2022). While employment in agriculture has been steadily decreasing for the last two decades (from 49% in 2000), the agricultural sector remains the largest employer in Nigeria, engaging more than 35% of the workforce in 2019 (World Bank Data Portal, 2022). In addition, more than 80% of Nigeria's farmers are smallholders delivering most of the country's production (Chiwuikem Chiaka, Zhen, Yunfeng, Xiao, Muhirwa & Lang (2022). Agricultural production is predominantly (85%) focused on crops (Federal Republic of Nigeria [FRN], 2016).

Given Nigeria's large population, its agricultural productivity is insufficient to meet increasing food demand (Federal Republic of Nigeria, 2016) in terms of both ensuring food security and transitioning toward healthier diets. The average productivity of major crops in Nigeria is less than 1,000 kg/ha on over 60% of farmland (Omotilewa, Jayne, Muyanga,

Aromolaran, Liverpool-Tasie & Awokuse 2021). In comparison, the Organisation for Economic Cooperation and Development (OECD) database suggests the global average is 3.5 times higher (Omotilewa *et al* 2021). The picture is the same for other crops and livestock. Critically, there is significant potential and opportunity for agricultural development in Nigeria.

Agriculture's vulnerability to climate change further impacts productivity gains in Nigeria. For example, irrigation coverage, which can mitigate the effects of erratic rainfall, is very low. While recent statistics are not available, irrigation coverage was estimated to be at just 0.3% of agricultural area in 2004 (Food and Agriculture Organization of the United Nations [FAO], 2021). In addition, approximately 80% of the population depends on climate-sensitive economic sectors such as rain-fed agriculture and artisanal fishing (FRN, 2020).

Food system transformation toward healthier diets will not be possible without improving agricultural productivity. This transformation would need to assist small-scale producers in achieving significant improvements in productivity and income, access to markets, and climate resilience, to meet the nutrition and food security needs of a growing population in a way that does not increase vulnerability to climate change and environmental degradation.

Diet Composition and Quality in Nigeria

Nigeria devotes 12% of all arable land to cassava production. The five main crops (cassava, maize, yams, paddy rice, and sorghum) represent 51% of harvested area and account for much of the average Nigerian diet (IFPRI 2022). As a result, Nigeria faces the compounded challenge of food insecurity, malnutrition, and growing obesity rates, as listed during the consultations. Given the sheer size of the country and its population, important

differences in dietary composition and quality are also observed between low- and high-income groups, urban versus rural populations, and southern versus northern regions.

Nigeria is experiencing a shift in dietary consumption, with diets becoming more diverse and moving away from meals predominantly made with staple grains and tubers. Simultaneously, the country is experiencing a move toward foods with a higher content of refined carbohydrates and highly processed foods and drinks with higher amounts of added sugars and unhealthy fats. This dietary shift, known as a nutrition transition, is evidenced by rising obesity and stagnating stunting in children. Independent studies have found that in Nigeria, urban obesity increased by 20% between 2002 and 2010 (Morgan & Fanzo, 2020). Despite this trend, malnutrition is currently ranked as the number one risk factor in the country, with suboptimal diets ranked seventh (Morgan & Fanzo, 2020).

In terms of specific nutrition indicators, 7% of children under five were affected by wasting and 37% by stunting in 2018. While stunting fell by as much as 8% from 2008 to 2015, it increased drastically to 44% in 2016, due to factors including Boko Haram violence and low oil revenues (Food Security Information Network, 2017). Wasting rates have been even more variable over the last decade. Although the prevalence of anemia has declined since 2000, it still affects one in two women of reproductive age, slightly higher than the average for sub-Saharan Africa. The prevalence of anemia at around 50% has persisted since 2011 (Global Nutrition Report, 2020).

The World Health Organization estimated the prevalence of obesity among adults to be around 9% in 2016 (WHO, 2021), although data from a systematic review in 2013 suggest this estimate may have been low (Chukwuonye, Ohagwu, Ogah, John, Oviasu, Anyabolu, Ezeani, Iloh, Chukwuonye, Raphael, Onwuchekwa, Okafor, Oladele, Obi, Okwuonu, Iheji, Nwabuko, Nnoli & Okpechi 2022). According to the Global Nutrition Report (2020), the

prevalence of obesity and overweight in Nigeria is increasing. Importantly, there is a gender difference in the trends of overweight and obesity, with 36% of women being overweight and 13% obese, compared to 22% and 5% of men, respectively (Global Nutrition Report, 2020). Nigeria is now facing the need to consider policies to promote diets that are both sufficient and healthy.

Affordability of Healthy Diet in Nigeria

Healthy diet is one of the basic needs for people to lead an active and healthy life. A healthy diet provides not only adequate calories but also adequate levels of essential nutrients and other food components that explain the link between food and health (Herforth et al. 2020). However, access to healthy diets by all people at all times has not been achieved by current food systems, due in part to affordability constraints (FAO, IFAD, UNICEF, WFP & WHO 2020; Bai, Costlow, Ebel, Laves, Cleda, Violin, Zamek, Herforth & Masters 2021). For example, despite improvements in household's spending toward meeting the cost of healthy diets (CoHD) in recent years, healthy diets are still unaffordable for lower income households in Nigeria.

Based on data from 2018/19, a recent study shows that households in the lowest income (expenditure) quintile in Nigeria would have to increase food expenditures by 13% on average to be able to purchase the least-cost heathy diet, and by additional 43% to incorporate current preferences in their choice of healthy foods (Mekonnen & Akerele 2021). Furthermore, unaffordability of a healthy diet as measured by the least cost diet as a share of food expenditures is higher in rural than urban areas; and correspondingly in the northern, relative to the southern zones, where the prevalence of poverty and inequality is also much higher (NBS 2020).

In 2019, the food expenditure share of the average household in Nigeria was about 56%, reaching over 60% in northern zones and rural areas (NBS, 2021). Analysis of the same 2018/2019 NLSS data shows the food expenditure share of lower income households (i.e., poorest 20%) was over 65%. This suggests that it would be challenging for poorer households to afford healthy diets without severely cutting back on important investments such as expenditures on education and health (Mekonnen, Adeyemi, Gilbert, Akerele , Achterbosch & Herfoth(2023). Many factors contribute to the cost and affordability of healthy diets either directly or indirectly (Bai et al. 2021). For instance, transport infrastructure links producers to input and output markets, reduces transport costs, contributes to agricultural productivity and improved incomes (FAO et al. 2020; Nakamura et al. 2019), and facilitates employment opportunities (even though some social groups may lose their farmland to the construction of transport networks) (Khanani et al. 2021).

Similarly, electricity contributes to food production as source of energy for irrigation, food processing, the use of information and communication technologies (ICT) and other innovations which facilitate food supply chains such as cold storage facilities that help reduce food losses and improve food supply (Candelise et al. 2021). Security, governance, and the strength of institutions are also critical components of the investment climate that facilitate entrepreneurship and innovations, which in turn influence the cost of transactions in food production, processing, marketing, distribution systems, and productivity (Mekonnen, 2023).

Regardless of the channel, each component of food systems and food system drivers, when in place, can contribute to the creation of jobs, improvement of incomes and purchasing power ((Mekonnen, 2023), and increasing affordability of healthy diets (Herforth et al. 2020). Nonetheless, the business environment and food system components and drivers may differ across a country, and correspondingly their effect on affordability of healthy diets across states and socio-economic groups within a state may be different.

The National Bureau of Statistics' Annual Abstract of Statistics (2017) reveals differences among Nigerian states in terms of key food system indicators. For example, density of roads (length of roads in kilometres per square kilometre of land area) varied from 0.02 or less in Bayelsa, Yobe, and Sokoto to 0.15–0.20 in Anambra and Lagos states; and the share of households with access to electricity in 2016 varied from below 30% in Taraba, Jigawa, Zamfara, Yobe, Ekiti and Bauchi to above 80% in Abia, Rivers, Edo, and Lagos, among others. Despite research to understand the relationship between household dietary diversity and nutrient adequacy and components of food systems (Mekonnen, Akerele, Achterbosch, De-Lange & Talsma 2021), there is limited evidence linking affordability of healthy diets and food systems across Nigerian states. There is a need for us to look into nutritional planning involving formulation of a nutrition policy and overall long-term planning to improve production and supplies of food.

Nutritional Planning in Nigeria

This involves political commitment by the government. A well planned and well executed long term project can accelerate the developmental process and the benefits can be rewarding and permanent. Nutritional planning involves formulation of a nutrition policy and overall long-term planning to improve production and supplies of food, ensure its equitable distribution and programs to increase the purchasing power of people. This may include, land reforms, proper guidance in agriculture to help farmers to get better yields from their lands, help in proper marketing of farm produce.

To help increasing the capacity of people to buy nutritious food in adequate quantity, income generating activities for the weaker sections of the community, making available good quality food in affordable prices through proper public distribution system, etc. are some of the plans for the government to implement. According to the final report of

Abbreviated Resettlement Action Plan for Prioritized Ecological Sites in Ekiti State (2021), the plans are discussed in the next section.

Direct Nutrition and Health Intervention in Nigeria

The direct forms of nutrition and health intervention in Nigeria include the following:

- **Improved health care system:** Infections like malaria, measles and diarrhea are prevalent in our society and they precipitate acute malnutrition among children and infants. A good health care system that provides immunization, oral rehydration, periodic deworming, early diagnosis and proper treatment of common illnesses can go a long way in preventing malnutrition in the society.
- **Nutrition education:** People can be educated on;
    - The nutritional quality of common foods.
    - Importance and nutritional quality of various locally available and culturally accepted low cost foods.
    - Importance of exclusive breastfeeding for six months and continuing to breast feed up to two years or beyond.
    - Damage caused by irrational beliefs and cultural practices of feeding
    - Recipes for preparing proper weaning foods and good supplementary food from locally available low-cost foods.
    - Importance of including milk, eggs, meat or pulses in sufficient quantities in the diet to enhance the net dietary protein value.
    - Importance of feeding children and adults during illness.
    - Importance and advantages of growing a kitchen garden.
    - Importance of immunizing their children and following proper sanitation in their day to day life.

- **Early detection of malnutrition and intervention**
    - The longer the developmental delays remain uncorrected, the greater the chance of permanent effects and hence intervention must occur during pregnancy and first three years of life.
    - A well recorded growth chart can detect malnutrition very early. Velocity of growth is more important than the actual weight at a given time
    - If growth of the child is slowed or is arrested as shown by flat curve on the growth card, physician should be alerted and any hidden infection or any reason for nutritional deficiency must be evaluated and taken care of.
    - If growth chart is not maintained, anthropometric indices like, weight, height mid arm circumference, and chest circumference etc. can be measured and used for evaluation of nutrition.
- **Nutrition supplementation**: Usually, biologically vulnerable groups like pregnant women, infants, preschool going and school going children are targeted by various welfare measures conducted by the government. Calories, proteins and micronutrients like iron, vitamin A and zinc can be supplemented.

Other Strategies for Preventing Malnutrition in Nigeria

UNICEF (2018) adopted some strategies to prevent malnutrition, these are:

- **Biofortification:** Micronutrient malnutrition is often called hidden hunger and is a serious health problem throughout the world. Biofortification is the process of breeding; where the food crops which are rich in bioavailable micronutrients for example vitamin A, zinc, and iron etc. are “biofortified” by loading higher levels of minerals and vitamins in their seeds and roots during growth. Unlike common fortification which needs repeated addition of particulate nutrient, biofortification is a one-time investment in dissemination

of nutrient-dense varieties and becomes self-sustaining. With the help of biofortification, scientists can provide farmers with crop varieties that provide essential micronutrients that can naturally decrease anemia, cognitive impairment, and other malnutrition related problems which have affected billions of people. For example, in Philippines a 9-monthfeeding trial of rice containing an additional 2.6 (PPM) of iron showed efficacy in improving body iron stores among iron deficient women. Likewise, a feeding trial of orange sweet potato with schoolchildren in South Africa showed improvements in their vitamin A status due to high beta-carotene

- **Probiotic foods:** In African continent the incidents of diarrhoea are high, which is a main cause of child mortality of less than five years old. The consumption of fermented foods containing probiotics will be one of the opportunity by which health of children may be improved. Fermentation is a preservation technique, hence can prevent postharvest losses, detoxifying the raw materials as well as increasing the intake of nutrients, thus alleviating malnutrition. However, for those trying to make a difference, solutions are slowly being explored. These include:
    - The establishment of networks in which local people can set up their own kitchens and produce probiotic foods the isolation of African bacterial strains from traditional foods, and developing them for probiotic applications.
    - Attempts to commercialize fermented food processing to account for regional variations in raw materials, recipes and production methods and starter culture technology.

Assessing the Impact of Agriculture on Food Security in Nigeria

Agriculture education plays a key role in the promotion of social, economic and cultural development in Nigeria from time memorial. It worth being emphasized at all levels of education to enhance food sustainability especially in Nigeria where the population is

increasing rapidly (Owoseni, Ayeni, Ajayi & Eniafe 2022). In developed countries, such as USA, China, and Brazil, agriculture education is ranked highly and is offered as a compulsory subject in the curriculum (Kuri, Vines, Crowder & Abaye (2023). Agriculture has been the main source of food and nutrition to the nation. It also supplied essential raw materials to industries and provides employment for 70 percent Nigerians who reside in the rural areas and predominantly engage in agricultural production. (Owoseni *et al*, 2022).

Education in agriculture involves instructions on crop production, livestock management, soil and water conservation, irrigation farming among additional areas (Kuri, *et al* (2023). It further involves food production that help farmers increase subsistence and commercial production leading to quality life of the population. Agriculture is essential and its singular role is to ensure that diverse, nutritious foods, adequate to meet the needs of people of all ages, are available and accessible at all times, either from the market or from farmers' own production.

Despite the laudable roles of Agricultural education, Nigeria is still facing the problem of hunger as a result of food insecurity. Hunger syndrome is a bit difficult to understand despite the natural position of Nigeria as a green area with huge resources endowment. The persistence of hunger, poor nutrition, food insecurity and poverty must therefore be to a large extent, the failure of the agricultural sector to fully impact positively on the people. There is a major problem of food insecurity in Nigeria. This is demonstrated by the widening food gap. The gap in food demand and supply is met mainly from commercial food imports (Fukase, & Martin (2020).

One of the most fundamental agricultural education objectives is ending hunger, achieving food security, improving nutrition and sustainable agriculture (Owoseni *et al*, 2022). In Nigeria the food problem has become a household, political and economic issue.

Improving nutrition is a major goal of agricultural programmes and policies, and substantial evidence confirms that increases in agricultural production alone and/or increased income do not necessarily translate into improved diets and nutrition without concurrent and well-designed nutrition education and behaviour change approaches. It is now well accepted, that in order to make agriculture work for nutrition, agricultural production and markets must improve access to diversified nutrient-dense foods from all the food groups.

Challenges of Food Security in Nigeria

Various authors have carried out studies on the issues of rural areas, produce and food security. For instance, the study of Egwuma, Muhammed, Ojeleye, Oladimeji, & Hassan (2019) on Ado Ekiti, Nigeria looked at regional productivity and marketing of cassava in the study area. The study emphasized that cassava as a stable food is capable of providing regional employment if only it is well marketed and processed in conformity with world standard. The author recommended that development of information system in marketing, provision of assistance or support for cassava farmers, processors and marketers in the region will promote agricultural production and sustain food security.

Olorunfemi, (2018) revealed that adequate road transport system provides suitable means of transportation and distribution of agricultural produce to the market. The author used interview and informal conversation to receive information for the study. In the course of the study, 60 farmers were selected for interview and findings shows that the farmers in a community that is link with roads are the one that have quick access to the farm input on time. The author concludes that with adequate road accessibility, agricultural production will be on high. Although, the author did not provide information on the transportation problems hindered the farmers in the study area.

Pawlak & Kołodziejczak (2020) observed that transport and marketing field is very vital to the development of agricultural sector and there is a wide range of measures which can be taken to support food security and agricultural development in developing nations. According to the author, this can be done through the investment in rural roads and tracks, improve the availability and efficiency of freight vehicles, and measures to reduce the variability of agricultural prices between different markets. The author noted that if the above measure is taken into consideration, it will reduce transport cost and market prices of farm produce which will invariably sustain food security.

Peng & Berry (2018) noted that food security involves three components; food availability, food access and food utilization. Food availability implies sufficient production or imports to meet the food needs of the population. The level of sufficiency of food has to be measure by individual whether their target is met in term of food needed. Agriculture is fundamental means of ensuring food security, and is one of the most important sectors of the Nigerian economy. This is according to Osabohien Adeleye, & Osabuohien (2021) contributes more than 30% of the total annual GDP, employs about 70% of the labour force, accounts for over 70% of the non-oil exports and, provided over 80% of the food needs of the country.

The first decade of Nigerian independence (1960-1970) opened the way to food shortages as a result of oil discovery that brought about declining agricultural production and increasing population growth rate. The increase in population at a rate considerably higher than the rate of increase in food production has continued to widen the gap between domestic food supply and domestic demand. This disparity has led to rising food prices (85-125% increases in many Nigerian cities) and declining foreign exchange earnings from agricultural exports. The interaction of these factors has led to food insecurity and the idea of self-

sufficiency is becoming more and more difficult to achieve due to declining agricultural production and inefficient food marketing system (Nwokenkwo, Kehinde & Bello (2023).

Concept of Healthy Living

Healthy living refers to perpetual condition of all-round well-being in terms of a person's physical, social, mental, emotional, and spiritual state. The European Food Information Council (EUFIC) (2023) explained that healthy living involves having the opportunity, capability and motivation to act in a way that positively affects your physical and mental well-being. D'Moore (2019) explained that optimal health can only be obtained through the synergistic interaction of the body, mind and spirit. Though the definition of health has often been limited to bodily wholeness, and sometimes extended to mental soundness, there are overwhelming evidences in literature that the true definition of good health encompasses the wellness of the physical, psychological, social and spiritual parts of any human (Li, Hu & Chi, 2022; Fung, Leung, Chan, Lau, & Chan, 2020).

Physical Health

Physical health includes a person's wellbeing in sensation, energy, physical strength, body functioning, physiological responses and pathological state. Physical health is a state of well-being that encompasses the body's ability to function optimally and maintain its biological, physiological, and mental functions (Schramme, 2023; Koipysheva, Lebedinsky & Koipysheva, 2018). It is a dynamic state that is influenced by various factors such as genetics, lifestyle, environment, and social determinants of health (Koipysheva, et al, 2018). According to Koipysheva et al. (2018), physical health is "the process of preserving and developing its biological, physiological and mental functions, optimal work capacity and social activity with the maximum life expectancy" (Koipysheva et al., 2018).

The World Health Organization (WHO) defines physical health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”. This definition emphasizes the holistic nature of physical health and highlights the importance of mental and social well-being in addition to physical well-being. The WHO definition has been criticized for being too broad and utopian (Schramme, 2023). However, Schramme (2023) argues that the WHO definition puts forward a holistic account, not a notion of perfect health.

Physical health is an essential component of overall health and well-being. It is associated with numerous health benefits such as reduced risk of chronic diseases, improved cognitive function, and better quality of life (Nishat, 2022). Physical activity is a key determinant of physical health and is associated with numerous health benefits. Regular physical activity can help improve cardiovascular health, reduce the risk of obesity, and improve mental health (Nishat, 2022).

In conclusion, physical health is a dynamic state that encompasses the body’s ability to function optimally and maintain its biological, physiological, and mental functions. It is influenced by various factors such as genetics, lifestyle, environment, and social determinants of health. The WHO definition emphasizes the holistic nature of physical health and highlights the importance of mental and social well-being in addition to physical well-being. Physical health is an essential component of overall health and well-being and is associated with numerous health benefits. Regular physical activity is a key determinant of physical health and is associated with numerous health benefits.

Psychological Health

Psychological health includes soundness of cognition, perception, mood, affection, problem-solving ability, memory, willpower, and decision making. Psychological health is a

broad concept that encompasses the mental and emotional well-being of an individual. It is defined as “a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community” (WHO 2022, Manwell, Barbic, Roberts, Durisko, Lee, Ware, & McKenzie, 2015) Psychological health is influenced by various factors such as genetics, environment, lifestyle, and social determinants of health (Rollo, 2024).

According to Donatelle and Ketcham (2020). psychological health is “the sum of how we think, feel, relate, and exist in our day-to-day lives. Our thoughts, perceptions, emotions, motivations, interpersonal relationships, and behaviors are a product of our experiences and the skills we have developed to meet life’s challenges.”

Mental health is a key component of psychological health. Mental health is defined as “a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community” (Manwell, et al, 2015). Mental health is influenced by various factors such as genetics, environment, lifestyle, and social determinants of health (Rollo, 2024).

Psychological health is essential for overall health and well-being. It is associated with numerous health benefits such as reduced risk of chronic diseases, improved cognitive function, and better quality of life. It is also associated with better academic and occupational performance (Ernstmeyer& Christman, 2022).

In conclusion, psychological health is a broad concept that encompasses the mental and emotional well-being of an individual. It is influenced by various factors such as genetics, environment, lifestyle, and social determinants of health. Psychological health is essential for

overall health and well-being and is associated with numerous health benefits. Mental health is a key component of psychological health and is also associated with numerous health benefits.

Social Health

Social health is the aspect of well-being that stems from connection and community, such as having close bonds with family and friends, enjoying a sense of belonging to groups, and feeling supported, valued, and loved. Social health is a multidimensional concept that encompasses the social, emotional, and psychological aspects of an individual's life (Thomas, 2023). It is defined as "the ability to interact effectively with others and the environment, to establish and maintain relationships, and to adapt to change and cope with adversity" (Allen, 2024). Social health is influenced by various factors such as genetics, environment, lifestyle, and social determinants of health (Alegría, NeMoyer, Ye Wang, & Alvarez, 2018).

According to Schramme (2023), social health is "that dimension of an individual's well-being that concerns how he gets along with other people, how other people react to him, and how he interacts with social institutions and societal mores. Social health is a dynamic state that is influenced by various factors such as social support, social networks, and social capital (Alegría et al, 2018). Social health is essential for overall health and well-being. Social health is also associated with better academic and occupational performance (Madeline, 2021).

In conclusion, social health is a multidimensional concept that encompasses the social, emotional, and psychological aspects of an individual's life. It is influenced by various factors such as genetics, environment, lifestyle, and social determinants of health. Social health is essential for overall health and well-being and is associated with numerous health benefits.

Relationship between the Aspects of Healthy Living

Healthy living, therefore, involves the synergy of these three aspects, and there may be a relationship between such a synergy and the observance of the aspects of sustainable food consumption., and this may be true among civil servants. The three dimensions of health, namely physical, psychological, and social, are interrelated and interdependent (Schramm, 2023; Lintang, 2021). Physical health is the foundation of overall health and well-being, as it is the basis for mental, and emotional, (Mahindru, Patil & Agrawal 2023). Psychological health is closely linked to physical health, as poor physical health can lead to psychological distress, and vice versa (Lintang, 2021). Social health is also closely related to physical and psychological health, as social support and social networks can have a positive impact on both physical and psychological health (Siddall & Macleod, 2018).

The relationship between the three dimensions of health is complex and multifaceted. Physical health can impact psychological health by affecting mood, energy levels, and cognitive function (Ohi, 2023). Psychological health can also impact physical health by influencing health behaviors such as diet, exercise, and substance use (Green, 2023). Social health can impact both physical and psychological health by providing social support, reducing stress, and promoting healthy behaviors (Bozek, Nowak & Blukacz, 2020).

In conclusion, the three dimensions of health are interrelated and interdependent. Physical health is the foundation of overall health and well-being, while psychological, social, and spiritual health are closely linked to physical health. The relationship between the three dimensions of health is complex and multifaceted, with each dimension impacting the others in various ways. Understanding the relationship between the three dimensions of health is essential for promoting overall health and well-being.

Concept of Civil Servants

Civil servants are government employee who works in the public sector and are responsible for implementing government policies and programs (Longley 2023). Civil servants play a crucial role in the functioning of a government by carrying out various administrative, executive, and managerial tasks. The concept of civil service has evolved over time and varies across different countries, but it generally embodies the principles of neutrality, professionalism, and service to the public. Civil servants are essential participants in the management and governance of a nation with a dynamic civil service sector, which actively facilitates the provision of public services and the execution of governmental policies (Free balance 2022). The civil service is organized into distinct ministries, departments, and agencies, each assigned specific functions and duties. These civil servants work under the guidance and supervision of political leaders and elected officials to ensure the effective implementation of government programs and initiatives, Civil servants are expected to be neutral and impartial in their work, regardless of their personal beliefs or political affiliations. This ensures that government policies are implemented fairly and without bias. They are typically chosen through competitive exams or merit-based selection processes. This emphasis on professionalism helps ensure that individuals with the necessary skills and qualifications are appointed to key government positions. The primary purpose of civil service is to serve the public interest. Civil servants are tasked with implementing government policies that aim to address the needs and concerns of the general population. Civil service often operates within a hierarchical structure, with various levels of authority and responsibility. This structure allows for efficient decision-making and the implementation of policies at different levels of government, while civil servants work under the political leadership of elected officials, they are expected to remain politically neutral in their duties. Their allegiance is to the state and its institutions rather than to any particular political party. Once employed, civil servants are expected to adhere to high ethical standards

and maintain integrity in the discharge of their duties. However, the high-pressure nature of civil service work can sometimes lead to stress-related eating habits. Some civil servants may turn to comfort foods or snacks as a way to cope with stress or as a means of relaxation during breaks. Meanwhile, civil servants, especially those in lower income brackets, may have to be mindful of their expenses when it comes to food. This can lead to a preference for affordable options or home-cooked meals to save money. The correlation between sustainable food consumption and healthy living among civil servants is pivotal, as the dietary choices made within the civil service sector can significantly impact both individual well-being and broader environmental sustainability. Embracing sustainable food consumption practices, such as prioritizing locally sourced, organic, and ethically produced foods, not only promotes personal health but also contributes to the reduction of the carbon footprint associated with food production and distribution (Çakmakçı, Salık, & Çakmakçı 2023). Civil servants who adopt sustainable food consumption habits are more likely to consume nutrient-dense foods, supporting their physical health, mental well-being, and overall vitality. Additionally, sustainable food consumption aligns with the principles of environmental conservation and responsible resource management. By choosing foods that are produced with minimal environmental impact, civil servants contribute to the overall goal of creating a more sustainable and resilient community. The relationship between sustainable food consumption and healthy living in the civil service sector thus underscores the interconnectedness of individual well-being, environmental sustainability, and the broader societal impact of dietary choices. Encouraging and promoting sustainable food consumption practices among civil servants can lead to a healthier workforce and contribute to the development of environmentally conscious communities.

Relationship between Sustainable Food Consumption and Healthy Living

Eating sustainably can be correlated with healthy living within any population, especially among civil servants. Sustainable food consumption refers to dietary choices and practices that promote environmental sustainability, such as consuming locally sourced, organic, plant-based, and minimally processed foods. Healthy Living encompasses overall well-being, including physical, mental, social and spiritual health, influenced by dietary habits and lifestyle choices. One of the biggest aspirations of the people in the modern societies is maintaining a healthy life. This is the goal of the many people around the world, doctors, dieticians, as well as social and religious workers offers various ways to attain and maintain it. The key to a healthy life, for many, is about raising the quality of one's physical, mental and spiritual life.

For physical healthiness, ensuring good nutrition (such as eating a varied, well-balanced diet means eating a variety of foods from each of the different food groups daily) is thought to be very central. Nutrition refers to the processes involved in taking in, assimilating and utilizing nutrients in food for growth, energy, and maintenance (Truswell, Carpenter & Snell (2024). Good nutrition is usually regarded as varied and diverse sources of nutrients in proportional amounts without overeating. It also includes eating breakfast daily, choosing meals and snacks wisely, drinking enough water and other fluids and maintaining a healthy weight. The quality of the food one consumes and the amount of it are also very important. As many would suggest, eating a wide variety of healthy and sustainable foods promotes good health and helps to protect against chronic disease (U.S. Department of Agriculture, 2015). This suggests the relationship between sustainable food consumption and physical health of individuals. However, the association may transcend to the other two aspects of human health.

In terms of the psychological aspect of human health, the study of Zanatta, Mari, Adorni, Labra, Matacena, Zenga and D'Addario (2022) associated lower levels of anxiety,

depression, stress symptomatology and higher perceived subjective well-being with healthier-sustainable food consumption behaviors. The study of Rossa-Roccor, Richardson, Murphy and Gadermann (2021) reveals a significant positive association between the junk food component and depression as well as anxiety.

Mazhari, Mazhari and Hakimzadeh (2023) also posited that one of the main ways of reforming the society,and reviving human nature is the health of the food process from the farm to the table (farm, transportation, product processing, cooking, while eating). These reported forms of relationship between sustainable food consumption and healthy living may apply to every group of people, though there remains a gap in knowledge as to the existence of such relationship among civil servants.

The interest in eco-friendly food has steadily risen over the past few decades (Petrescu, Dacinia, Vermeir, Iris, Petrescu-Mag, & Ruxandra. (2019). Sustainable food consumption refers to ensuring access and utilization of food for all present and future generations, supporting an active, healthy life, and doing so in ways that are economically, socially, and environmentally sustainable (FAO and WHO. 2019). A report by Consumers International (2004) notes a surge in the demand for a diverse range of environmentally friendly and eco-conscious foods due to the increased marketability of sustainable food production and consumption. In response to the growing demand for "green food," Lifestyle of Health and Sustainability (LOHAS) consumers have become a crucial customer segment in the foodservice industry (Cortese, 2003; Rogers, 2005). LOHAS consumers prioritize promoting a lifestyle of health and sustainability by supporting movements that advocate for local, organic, and low-carbon foods (Choi, Sooyeon, Feinberg, & Richard. 2021). These consumers also make choices such as purchasing organic food, natural skincare, and energy-efficient household appliances. As a result, LOHAS consumers are increasingly influencing

the restaurant market. Notably, a rising number of LOHAS diners not only prioritize the environment and natural resources but also emphasize healthy food choices. This has led to a preference for restaurants that embrace environmentally friendly practices and offer naturally healthy food options (Colorado Restaurant Association, 2008). Although Nystrand, B. T., & Olsen, S. O. (2020) demonstrate that food-related lifestyles significantly predict consumer attitudes and behavioral intentions, their study does not establish a connection to LOHAS consumers. Sustainable food consumption has gained momentum as a crucial approach to address the interconnected challenges of food security, environmental degradation, and public health.

Espinosa, Adams, Sinno, Cantu-Aldana, Tamez, Marrero, Bhupathiraju, & Mattei (2022) emphasized that animal-based diets generally have a higher environmental impact in terms of greenhouse gas emissions, land, and water use compared to plant-based diets. Adopting sustainable food consumption habits, such as reducing meat consumption and favoring plant-based foods, can significantly mitigate environmental degradation. Plant-based diet rich in fruits, vegetables, whole grains, and legumes has been associated with a lower risk of cardiovascular diseases (Aune 2019). Additionally, sustainable food consumption reduces the intake of saturated fats and cholesterol, sustainable food consumption patterns are often associated with lower calorie intake and higher dietary fiber, contributing to better weight management and reduced risk of obesity (Cena,& Calder 2020). While plant-based diets can be nutritionally adequate, careful planning is essential to ensure the intake of essential nutrients such as protein, iron, calcium, and vitamin B12 (Esquivel 2022). Incorporating a diverse range of plant foods can help achieve nutrient adequacy.

Sustainable food consumption also intersects with social and economic aspects of health. Local food systems and community-supported agriculture can promote social connections, community engagement, and food sovereignty (Piccoli, Rossi & Genova (2021). Supporting

local and sustainable food systems can have economic benefits by promoting local businesses and reducing the carbon footprint associated with food transportation.

Despite the potential benefits, transitioning to sustainable food consumption patterns presents challenges, including cultural preferences, accessibility to affordable healthy foods, and misinformation about nutrition (Webb, Flynn, Kelly & Thomas, 2023). Addressing these barriers requires a multifaceted approach involving policy interventions, education, and community engagement.

Influence of Demographic Characteristics on Sustainable food consumption and Healthy Living

Sociodemographic characteristics of civil servants may influence the relationship between their sustainable food consumption practices and the healthiness of their living. This section describes the influence of demographic characteristics on sustainable food consumption and healthy living, especially among civil servants. The specific characteristics considered in this study are the age, gender, location, and socioeconomic status of the civil servants.

Influence of Age on Sustainable Food Consumption and Healthy living

Sustainable Healthy Diets are dietary patterns that promote all dimensions of individuals' health and wellbeing; have low environmental pressure and impact; are accessible, affordable, safe and equitable; and are culturally acceptable (FAO & WHO 2019). This review delves into the nexus between sustainable food consumption habits and their impact on age-linked health outcomes (Johnston, Fanzo & Cogill, 2014). Nutritional requirements shift with age. Infants and toddlers have distinct needs to support their growth, whereas the elderly might prioritize nutrients that bolster bone health and deter age-related

ailment, poor bone health can cause conditions such as rickets and osteoporosis and increase the risk of breaking a bone from a fall later in life.

A good diet is only one of the building blocks for healthy bones, avoiding certain risk factors for osteoporosis. As one ages, dietary inclinations evolve, he young might venture into diverse food options, whereas the elderly often stick to familiar dietary routines. Instilling healthy eating habits from a young age can yield enduring health advantages. With age, metabolic rates often decline, impacting energy use. Hence, adjusting caloric consumption and prioritizing nutrient-rich foods becomes crucial for weight management and sustained vitality.

Activity levels also fluctuate across age brackets. Kids and teens might gravitate towards spontaneous play, whereas adults lean towards structured sports or exercise regimens. The elderly might opt for gentler exercises to uphold mobility and stave off age-associated setbacks. As aging progresses, mental well-being, especially cognitive health, gains prominence. Nutrients such as omega-3s and antioxidants play pivotal roles in cognitive vitality, making them especially valuable for the older demographic. Age-specific risks for chronic ailments also differ; hence, younger individuals often emphasize preventative actions like balanced diets and consistent physical activity. Life milestones, like pregnancy or menopause in females, dictate distinct nutritional demands. For instance, pregnancy necessitates heightened nutrient intake to nurture the fetus. Social influences, societal norms, and surroundings mold dietary choices across age groups. Teens might be swayed by peer selections, while the elderly's preferences might be shaped by retirement or altered social interactions. Access to health information varies with age; younger cohorts might harness digital platforms, whereas seniors might favor conventional channels. Additionally, economic considerations can dictate dietary decisions; the youth might grapple with financial limitations, whereas seniors might enjoy more financial stability.

Emerging research indicates that adopting sustainable dietary habits can benefit health throughout one's life. Specifically, diets like the Mediterranean and vegetarian, which are deemed sustainable, have been linked to lower chances of developing chronic ailments like cardiovascular issues and type 2 diabetes (Dominguez, Di Bella, Veronese & Barbagallo, 2021).

As people age, they commonly become more vulnerable to chronic conditions. However, by embracing sustainable dietary practices, they may find protection through the delivery of essential nutrients and bioactive substances that support healthy aging. (Dominguez, Veronese, Baiamonte, Guarrera, Parisi, Ruffolo, Tagliaferri, & Barbagallo 2022).

Nutritional Considerations for Different Age Groups

Sustainable dietary suggestions can differ among age brackets because of individual nutritional necessities and culinary choices. For kids and teens, embracing sustainable food consumption habits can lay the groundwork for sustained healthful routines and bolster proper growth and maturation (UNICEF, 2021). For the elderly, adopting sustainable dietary habits can be pivotal in addressing age-associated ailments like osteoporosis and cognitive downturns. This approach underscores the importance of nutrient-rich foods and ensuring proper hydration (Arnold, Rajagukguk & Gramza-Michałowska, 2021). Embracing sustainable food consumption habits frequently requires shifts in dietary choices, which can impact one's psychological and social well-being throughout their life. For instance, older adult might encounter difficulties with accessing and affording certain foods, affecting their capacity to maintain sustainable food consumption habits (Rodríguez-Mañas, Murray, Glencorse & Sulo, 2023).

On the other hand, sustainable food consumption can cultivate a feeling of community and mutual accountability spanning different age groups. This encourages the exchange of knowledge and joint efforts in advancing sustainable food systems across generations. Sustainable food consumption is not just about immediate environmental benefits; it has the potential to influence long-term health outcomes and societal well-being. Let's delve deeper into the points you've raised:

Longitudinal Studies on Age-Related Outcomes

- **Longevity and Health span:** One of the primary interests would be to understand how sustainable food consumption patterns influence longevity and health span. For instance, diets rich in plant-based foods and low in processed foods have been associated with reduced risks of chronic diseases, which could potentially extend healthy life years.
- **Cognitive Function:** There's growing evidence suggesting that dietary patterns, such as the Mediterranean diet, are associated with better cognitive function and reduced risk of neurodegenerative diseases like Alzheimer's.
- **Metabolic Health:** Sustainable diets often emphasize whole foods, which can positively influence metabolic health markers such as blood sugar levels, cholesterol, and blood pressure over time.

Integration into Healthcare and Education

- **Healthcare Settings:** Healthcare professionals can play a pivotal role in promoting sustainable food consumption by incorporating it into dietary counseling sessions, creating awareness about the health benefits of sustainable choices, and providing resources to patients.

- **Educational Settings:** Introducing sustainable food consumption education in schools can have a long-lasting impact. It can help children and adolescents develop healthy eating habits early on, understand the environmental implications of their food choices, and become advocates for sustainable food systems in the future.
- **Policy Development:** Policymakers can implement strategies like incorporating sustainable food consumption guidelines into school meal programs, promoting local and seasonal produce in public institutions, or offering incentives for healthcare providers who integrate sustainable food consumption education into their practice.

Diverse Age Groups

- **Children and Adolescents:** Early education can lay the foundation for lifelong healthy habits. By teaching younger generations about sustainable food consumption, we can foster a culture that values both personal and planetary health.
- **Adults:** Many adults are now recognizing the importance of sustainable food consumption and are looking for ways to integrate it into their daily lives. Providing accessible resources, such as workshops, online courses, or community events, can support adults in making informed choices. Nemeth, Rudnak, Ymeri, and Fogarassy. (2019).
- **Elderly:** As people age, dietary needs and preferences may change. Sustainable food consumption can be tailored to meet the unique nutritional requirements of older adults while also considering environmental sustainability.

Influence of Gender on Sustainable food consumption and Healthy living

The influence of gender on sustainable food consumption and healthy living is a complex interplay of biological, cultural, and social factors. While there are general patterns, it's essential to recognize individual variations and the evolving nature of societal norms.

Biological differences between genders, such as variations in metabolism, hormonal profiles, and nutrient needs, can influence dietary choices. For instance, women may have different iron requirements due to menstruation, while men may require more protein

for muscle mass (Wohlgemuth, Arieta, Brewer, Hoselton, Gould & Smith-Ryan, 2021). Societal norms and expectations regarding body image and appearance can influence eating behaviors differently for men and women.

Cultural pressures may lead to distinct dietary patterns and attitudes toward health and wellness. Gender roles and expectations may shape perceptions of what constitutes "healthy" eating. For example, there might be cultural norms around men prioritizing protein intake for muscle-building and women focusing on low-calorie diets for weight management. Traditional gender roles can impact responsibilities related to food preparation and caregiving. Women, historically viewed as primary caregivers, may bear a larger share of responsibility for meal planning and preparation, influencing their food choices. Gendered marketing of food products and dietary supplements can contribute to distinct perceptions of health and influence consumption patterns, advertisements may target specific gender stereotypes, shaping preferences for certain types of food, gender-specific societal pressures related to body image can contribute to the development of eating disorders. Women may be more susceptible to societal expectations around thinness, while men may face pressures related to muscularity. Economic and social disparities may affect access to resources that contribute to sustainable and healthy living. These disparities can be gendered, with women in some societies facing greater challenges in accessing nutritious food, healthcare, and fitness resources. Women's reproductive health, including pregnancy and menopause, can influence dietary needs and healthy living practices. For example, the nutritional requirements during pregnancy may differ significantly from those during other life stages, gender differences in healthcare-seeking behavior may influence awareness and engagement in healthy living

practices, societal expectations around masculinity and femininity can impact individuals' willingness to seek medical advice and adopt preventive health measures.

Gender Differences in Dietary Choices

Several studies have pointed out distinct gender differences in dietary preferences and choices. For instance, research by (Dahal, Basnet, Khanal, Baral, & Dhakal, 2022), suggests that women are more likely than men to choose plant-based diets and prioritize organic and locally sourced foods. This inclination towards sustainable food choices among women may be attributed to heightened awareness of health and environmental concerns.

From a psychological standpoint, gender differences in risk perception and empathy towards environmental issues may also contribute to variations in sustainable food consumption behaviors. Johnson et al. (2022) found that women generally exhibit higher levels of environmental concern and empathy towards animals, which correlates with a greater propensity for sustainable food choices, including reduced meat consumption. (Scharfenkamp, K., & Wicker, P. 2023).

Influence of Location on Sustainable Food Consumption and Healthy Living

The locality of one's residence can significantly shape dietary habits by offering settings conducive to either nutritious or detrimental eating patterns. Individuals select their food based on personal and familial preferences, as well as the resources at their disposal. Drawing from fundamental economic principles, households acquire food and other commodities aiming to optimize their overall satisfaction or well-being, considering their distinct preferences and ensuring that the expenditure on these items does not exceed their total income. Emerging evidence indicates that frequent exposure to establishments offering primarily processed and calorie-dense foods, such as fast-food outlets, takeaways, cafés, restaurants, and convenience stores, could encourage and perpetuate unhealthy eating habits

(Bernsdorf, Lau, Andreasen, Toft, Lykke & Glümer, 2017). While Exposure to outlets offering fresh produce, such as supermarkets and greengrocers, can promote healthy eating habits (Bivoltsis, Trapp, Knuiman, Hooper & Ambrosini 2020). Accessing nutritious food is essential for both physical health and overall quality of life. Consistently consuming unhealthy food can result in various negative health consequences, such as obesity, diabetes, and heart diseases. The availability of nutritious food is shaped by both geographic and non-geographic factors, leading to disparities in access among different communities. Barriers to making healthy food choices encompass factors such as geography, finances, information, and cultural influences. Currently, most research primarily examines the relationship between geographic access to nutritious food and socio-economic status (SES) (Costa, Menezes, Oliveira, (2019). Numerous studies have identified a direct link between low socio-economic status (SES) and restricted access to high-quality food within specific local areas. A frequently neglected aspect of the spatial disparity in food access is the individual-level causality associated with food choices. People often opt for a variety of food purchasing and dining decisions, determining factors such as where, when, how, and what kinds of food to obtain. Understanding the influence of food access on food choices and sustainable food consumption goes beyond just broad regional analyses. It's crucial to evaluate how the quality of an individual's food environment specifically influences their decisions when purchasing food. A yet-to-be-investigated approach is to determine whether people's food preferences are influenced in real-time by their exposure to specific food environments, like the absence of nearby market that might hinder them from opting for healthier food selection, relying solely on the location of food outlets as a traditional measure for food access has significant drawbacks when trying to grasp the underlying reasons behind individuals' food choices. (FAO, IFAD, UNICEF, WFP and WHO. 2023).

The availability of local fresh produce markets can greatly motivate people to opt for healthier food options. On the other hand, a high concentration of fast-food outlets nearby can deter individuals from making healthy food decisions. (Sofie van Rongen, Poelman, Thornton, Abbott , Kamphius, Verkooijen & Emely de Vet (2020). The issue of food access can be viewed from various perspectives. It encompasses not just the physical proximity to food sources but also concerns such as the cost, the presence of culturally relevant food options, and understanding of nutritional information. Beyond these explanations, most research tends to focus on the geographical aspect, using the term "food desert" as a metaphor to depict regions lacking accessible, reasonably priced grocery stores that provide a wide selection of high-quality food items. These stores, particularly those offering fresh fruits and vegetables, are often referred to as "green retailers." (Zurawski, 2023).

In urban food deserts where there's a scarcity of these quality retailers, there's a proliferation of subpar food establishments like convenience stores and fast-food joints. These places typically offer only packaged, processed, and calorie-dense food options**.** Recent discussions about 'food deserts' have sharpened the focus on access to (un)healthy foods. Food deserts are areas where people have limited access to a variety of healthful foods. This may be due to having a limited income or living far away from sources of healthful and affordable food (Caporuscio, 2020). Ironically, the groups most in need often face the greatest restrictions in accessing affordable and varied food choices. Consequently, residents of these food deserts frequently find themselves reliant on smaller stores that offer pricier items with a more restricted selection of fresh produce, as highlighted in the journal "Health and Place." The influence of location on sustainable food consumption and healthy living is a complex interplay of various factors, including access to fresh and diverse food, cultural dietary practices, environmental conditions, community infrastructure, availability of resources such as fertile soil, abundant water sources and diverse climates.

Location plays a significant role in shaping our food choices. The availability of certain foods is influenced by climate, topography and natural resources of such environment. For example, coastal region often have variety of seafood's while region with dry land may rely on grains and meats, region with arid climate, poor soil quality, or limited access to transportation may experience food insecurity foods in areas with shorter growing seasons or limited access to fertile land, fresh fruits and vegetables may be scarce, this can lead to reliance on preserved or processed, access to transportation and trade routes impact the variety and availability of healthy foods, location influence the availability and affordability of different food items which also influence our choice of sustainable food consumption. The place where one resides plays a crucial role in the availability of fresh, locally grown produce and, consequently, shapes dietary preferences urban areas may have farmers' markets, community-supported agriculture (CSA) initiatives, and supermarkets that prioritize locally produced items. Different regions have unique cultural dietary practices that influence food choices. These practices may contribute to the sustainability of local ecosystems and promote healthy living.

Environmental factors like climate and soil quality play a pivotal role in determining the viability of farming practices and the cultivation of a wide array of nutritious foods (Tahat, Alananbeh Othman & Leskovar (2020). Geographical location plays a pivotal role in the accessibility of fresh, seasonal fruits and vegetables. Areas with coastlines or those blessed with temperate climates tend to offer a broader spectrum of produce year-round, thereby steering dietary selections toward a richer and more varied nutritional profile. Each locale boasts unique cultural dietary customs shaped by indigenous traditions, local farming techniques, and regional culinary traditions. Such customs invariably dictate the prevalence and consumption patterns of specific foods, thereby influencing the general health and wellness of the populace. The proximity to local agricultural enterprises and the adoption of

sustainable farming methods further dictates the prevalence of organic and locally cultivated produce. Locations that embrace practices like farmers' markets, community-supported agriculture (CSA), and farm-to-table initiatives tend to foster a culture of healthier dietary choices.

Influence of Income Level on Sustainable Food Consumption and Healthy Living

Level of income is one of the conditions to describe in Nigeria. It is a measure of the socio-economic status of a person, family or community. It refers to an individual's place within the social hierarchy, serving as a significant factor influencing health and overall well-being. (Nutakor, Zhou, Larnyo, Addai-Danso & Tripura, 2023). According to Olurankinse, (2019) socio-economic status can be described as the societal position and status of an individual or a group, frequently evaluated through a blend of education, income, and occupation. Social economic status can generally be categorized into three groups: high SES, middle SES, and low SES, which describe the socio-economic levels where a family or individual might belong. The socio-economic status (SES), encompassing elements like education, income, and profession, plays a pivotal role in promoting both sustainable and health-conscious lifestyles (Navarro-Carrillo, Alonso-Ferres, Moya & Valor-Segura, 2020). Those with a higher SES generally possess more financial means, empowering them to embrace sustainable initiatives like investing in eco-friendly technologies and renewable energy. Moreover, their access to quality healthcare, wholesome food, and recreational amenities tends to be more extensive. With enhanced educational opportunities associated with higher SES, there's a heightened awareness of environmental concerns and a propensity to adopt eco-friendly habits. Education also correlates with health literacy; those with advanced educational backgrounds tend to make more informed health choices, emphasizing prevention and nutritious diets. (Silva, Araújo, Lopes & Ray, 2023)

Furthermore, SES can influence housing choices, with higher SES individuals often opting for energy-efficient residences and neighborhoods adorned with green spaces. Such choices not only reflect environmental consciousness but also impact exposure to environmental hazards and access to recreational areas, crucial for holistic well-being (Selanon & Chuangchai, 2023). Occupations can also shape sustainable behaviors; professionals in eco-conscious fields typically exhibit a deeper commitment to sustainable living (Thorisdottir & Johannsdottir, 2020). Moreover, the nature of one's job, encompassing factors like workplace environment and stress levels, can directly impact health outcomes. Favorably, those with higher SES often secure jobs offering better conditions and a balanced work-life equilibrium. The influence of social networks is undeniable. High SES individuals frequently associate with peers who champion sustainability, fostering eco-friendly eating habits and healthy lifestyles through collaborative efforts and knowledge sharing. Such supportive social environments further amplify the adherence to healthy practices.

Lastly, the socio-economic backdrop can also bolster advocacy endeavors. Those with elevated SES often wield more resources to champion environmental causes and influence policy-making. Their elevated status typically grants them proximity to superior healthcare facilities, further underscoring the intertwined nature of SES, sustainability, and health outcomes. The quality of one's diet is significantly influenced by their socioeconomic status (SES), a relationship that has been acknowledged since the 1930s and is strongly supported by epidemiological evidence (Vinke, Navis, Kromhout & Corpeleijn, 2020). Those who are more affluent typically have greater access to nutritious, high-quality foods, albeit often at a higher cost. Conversely, individuals from lower socioeconomic backgrounds often find themselves constrained to opt for more affordable, yet less nutritious, food alternatives. The current upward trend in food prices further exacerbates the existing disparities in dietary patterns observed across different socioeconomic levels. Although overall food expenditures

have risen across households, the share of income allocated to food varies considerably between affluent and less privileged families.

According to Petrikova, Bhattacharjee & Fraser (2023), the typical Nigerian diet is relatively low in protein, high in carbohydrates and fibre, and moderate in the intake of fats and oils. In terms of carbohydrate sources, Nigerian meals have typically relied on cereals including rice, sorghum, millet, and maize and on roots and tubers such as cassava and yams. Economic factors play a pivotal role in shaping dietary preferences, with financial constraints more pronounced among economically disadvantaged groups. Research indicates that individuals with lower incomes often gravitate towards cost-effective food options, which unfortunately tend to be less nutritious. For instance, while fruits and vegetables are recognized as essential components of a healthy diet among lower-income populations, they are also frequently perceived as less affordable.

Consequently, affluent families typically incorporate a wider variety of fruits and vegetables into their diets compared to their less affluent counterparts. When it comes to meat consumption, the quantity consumed remains relatively consistent across households regardless of their socioeconomic status. However, lower-income families are more inclined to select cheaper, fattier cuts of meat. Generally, foods that are more affordable tend to be energy-dense, containing high levels of refined grains, sugars, and fats. These products offer a cost-effective source of calories compared to their nutrient-rich counterparts. This pattern is not unique to any single country; rather, it is a global phenomenon supported by extensive epidemiological data. Foods that are perceived as nutritious typically possess a higher quality and nutrient density, resulting in a higher cost per calorie compared to energy-dense alternatives.

Relationship between Socioeconomic Status (SES) and a Nutritious Diet

In the opinion of French, Tangney, Crane, et al. (2019). Higher socioeconomic status (SES) groups are more inclined to adopt healthy diets, characterized by whole grains, lean meats, fish, low-fat dairy, and abundant fruits and vegetables. Such dietary patterns are linked to reduced risks of heart-related issues and maintaining a healthy weight. In contrast, individuals from lower income backgrounds often base their food choices on affordability, leading them to opt for energy-dense foods that may lack essential nutrients. This pattern not only fosters hidden hunger due to nutrient deficiencies but also contributes to calorie excess and escalating obesity rates. The nutritional choices made by expectant mothers significantly impact both their health and the well-being of their offspring (Marshall, Abrams, Barbour, Catalano, Christian, Friedman, Hay, Hernandez, Krebs, Oken, Purnell, Roberts, Soltani, Wallace, & Thornburg, 2022).

Nutrition plays a pivotal role during the conception and prenatal stages, with poor dietary habits elevating risks like gestational diabetes in mothers already predisposed to insulin resistance due to obesity. Additionally, babies born with higher birth weights (fetal macrosomia) due to maternal obesity are more prone to childhood obesity, which further increases the likelihood of developing insulin resistance. There are also disparities in dietary quality observed among pregnant women, with certain demographics, such as Non-Hispanic Black women and those from low or middle-income brackets, exhibiting poorer diet quality compared to their counterparts (Parker, Tovar, McCurdy, & Vadiveloo, 2020). The cost of inadequate nutrition extends beyond immediate health concerns, influencing various life stages and underscoring the importance of addressing dietary disparities across socioeconomic and demographic lines.

Over- and undernutrition are at the core of this problem: 2013 figures from the WHO estimate the number of deaths due to obesity and overweight at over 2.8 million per year, conversely, malnutrition is currently blamed for over a third of child deaths. The cost to

society of poor diet goes beyond the monetary. The long-term effects of early undernutrition include reductions in intellectual ability, economic productivity and reproductive performance and the development of diabetes and cardiovascular disease. Studies have determined that intervention investments should be made within the first 1000 days of life if loss of functionality is to be avoided. Stunting, the most common form of undernutrition, affects 178 million children, mostly from Africa and Asia. Unaddressed, it becomes irreversible after the third year of life and can lead to restrictions in brain and muscle growth, adversely affecting mental capacity and future productivity.

The socioeconomic status remains a significant determinant in shaping dietary preferences. The societal repercussions of suboptimal dietary decisions, leading to both malnutrition and overconsumption, are alarmingly steep and on an upward trajectory. Such consequences touch individuals globally, transcending various societal strata and echoing through multiple generations, potentially setting the groundwork for forthcoming health crises. Addressing this issue hinges on delving deeper into its complexities, necessitating thorough research. This enhanced comprehension should catalyze heightened awareness among policymakers. Attaining these objectives could pave the way for policy revisions and the formulation and execution of preventive strategies, aiming to ensure optimal nutrition choices across populations.

Review of Related Empirical Studies

Irazusta-Garmendia, Orpí, Bach-Faig and González-Svatetz (2023) studied food sustainability knowledge, attitudes, and dietary habits among students and professionals of the health sciences. It was a cross sectional study conducted by administering questionnaire to online students and professionals of the health sciences between late December 2021 and April 2022, based on participant availability. A convenience sample of participants was

divided into two large samples: the first comprised two subsamples of university students, and the second was made up of health professionals consisting of university health sciences faculty professors and members of a college of pharmacists. The survey was completed by a total of 415 participants both university students in health sciences and health professionals. Results show that 78.8% were students of the health sciences and 21.2% were health professionals. Findings about the knowledge show that respondents indicated the following qualities as very important in sustainable food: being healthy for humans (70.36%), consisting of fresh products (62.65%), produced locally (62.41%), respectful of biodiversity (61.69%), and having a low environmental impact (60.24%). Regarding sustainable food production, 28.91% of respondents considered this very important, 41.69% important, 25.06% somewhat important, and 4.34% not very or not at all important. Overall, fruit and vegetables were consumed 1–2 or more times a day by 67.47% and 62.89% of the participants, respectively. Dairy products were also consumed 1–2 times a day by 48.19% of the sample. Red meat, on the other hand, was consumed 1–2 or fewer times a week by 82.89% of the respondents. Finally, the greatest discrepancy in terms of frequency of consumption was observed for processed meat, as 32.29% reported that they never eat processed meat, with another 20% eating it 3–5 times a week. A significant positive correlation was found between deeper knowledge and positive attitudes regarding sustainable food and higher consumption of fruit and vegetables. The study concludes that health science students and professionals, with greater knowledge and more favorable attitudes towards sustainable diets, have better eating habits in terms of consuming more fruits and vegetables and less red meat. This study is different from the present study in terms of variables, methodology and specificity of participants. The study of Irazusta-Garmendia *et al* (2023) was concerned with one of the two major variables in the present study (sustainable food consumption). The present study employed a correlation survey research design, using close-

ended questionnaires which were administered physically to obtain data from civil servants, whereas that of Irazusta-Garmendia *et al* (2023) employ a cross-sectional study, using close-ended questionnaire which was administered online.

Arslan and Alatas (2023) assessed the relationship between sustainable nutrition and healthy food choice. This study was conducted with university students between the ages of 19-45. The study data were collected between May 2022 and July. In the study, the Scale of sustainable nutrition knowledge was used for the sustainable nutrition knowledge level of individuals. The food choice scale was used to determine the food preference and the Sustainable and Healthy Eating Behaviors scale was used to determine the health food choice preference. The study involved 467 participants, and female made up 64.67% of the study's participants. The mean age of the group was 23.21 ± 6.13 years. Knowledge of sustainable nutrition increases by 1.365 for every 0.821 increase in educational level. The sustainable nutrition knowledge score increased by 1.529 points, the scale score for sustainable and healthy eating behaviors increased by 0.651 points, and the monthly income to the model increased by 1.611 times for every 1.109 unit ($p = 0.005$). The study concluded that most college students believe eating sustainably is important. Moreso, as people's education and knowledge about sustainable nutrition rise, so do their healthy eating habits. This study is similar to the present study in terms of variables, but different in terms of methodology and specificity of participants. The study of Arslan and Alatas (2023) was concerned with one of the two major variables in the present study (sustainable food consumption). The present study employed a correlation survey research design, using close-ended questionnaires to obtain data from civil servants.

Kowalsky, Morilla Romero de la Osa and Cerrillo (2022) studied sustainable diets as tools to harmonize the health of individuals, communities and the planet: A systematic search for articles published on sustainable diets and human/planetary health published between

2013 and 2020 was conducted on the databases PubMed, Cinahl, Scopus and Trip from 4 to 7 May 2020 in accordance with the PRISMA guideline. Results. A total of 201 articles was retrieved, but only 21 were included. A calorie-balanced diet mainly based on food of plant origin that would allow the attainment of 60% of daily caloric requirements and a low protein intake from animal foods (focusing in fish and poultry) could significantly reduce global morbi-mortality and the dietary environmental impact maintaining a framework of sustainability conditioned by the consumption of fresh, seasonal, locally produced and minimally packaged products. In Switzerland, it has been reported that a transition from the current Swiss diet to a pattern better adjusted to national recommendations (guidelines of Swiss society of nutrition) was the most sustainable option involving 36% lesser environmental footprint and 2.67% lower adverse health outcome (DALYs) compared with the current diet. This transition implies a slight increase in fruits and vegetables (from 265 and 239 to 325 and 291 g capita−1 day−1, respectively) and a more important increase in nuts and legumes (from 5 and 24 to 26 and 50 g capita−1 day−1, respectively). In addition, it decreased the consumption of roots and tubers (from 230 to 149 g capita−1 day−1) and a significantly decreased consumption of meat, fish, eggs and vegetable oil (from 129, 15, 25 and 71 to 33, 6, 18 and 26 g capita−1 day−1). The environmental footprint was quantified, showing a reduction of 54% in GHG emission, 32% in land use and 26%, 33% and 34% in water, nitrogen and phosphorus footprints, respectively. This study is similar to the present study in terms of variables, but different in terms of methodology. The study of Kowalsky *et al* (2022) was concerned with two major variables in the present study, one aspect of sustainable food consumption (environmental) and one aspect of healthy living (physical). The present study employed a correlation survey research design, using close-ended questionnaires to obtain data from civil servants, whereas that of Kowalsky *et al* (2022) employ a systematic review with narrative synthesis approach.

Springmann, Spajic, Clark, Poore, Herforth, Webb, Rayner and Scarborough (2020) investigated the healthiness and sustainability of national and global food based dietary guidelines (FBDGs). It was a modelling study, and a quantitative recommendation was extracted from 85 food based dietary guidelines (FBDGs). They followed a multistep process to quantitatively analyze national and global FBDGs. Firstly, they reviewed existing FBDGs and from the accompanying documents extracted the recommendations for a set of food groups that are relevant for health and environmental impacts. Secondly, they translated the recommendations—some were qualitative and some quantitative—into purely quantitative representations of suggested intake, or change in intake, for each food group. Thirdly, they constructed full diet scenarios by applying the quantitative FBDG recommendations to estimates of current intake for each food group and country. Fourthly, they analyzed the potential health and environmental impacts if the populations of countries with FBDGs changed their current diets to those that are in line with their FBDGs as represented by the diet scenarios. Finally, they analyzed the alignment of the different FBDGs with global health and environmental targets by modelling the universal, global adoption of each FBDG. They found out that adoption of national FBDGs was associated with reductions in premature mortality of 15% on average (95% uncertainty interval 13% to 16%) and mixed changes in environmental resource demand, including a reduction in greenhouse gas emissions of 13% on average (regional range −34% to 35%). When universally adopted globally, most of the national guidelines (83, 98%) were not compatible with at least one of the global health and environmental targets. About a third of the FBDGs (29, 34%) were incompatible with the agenda on non-communicable diseases, and most (57 to 74, 67% to 87%) were incompatible with the Paris Climate Agreement and other environmental targets. In comparison, adoption of the WHO recommendations was associated with similar health and environmental changes, whereas adoption of the EAT-Lancet recommendations was associated with 34% greater

reductions in premature mortality, more than three times greater reductions in greenhouse gas emissions, and general attainment of the global health and environmental targets. As an example, the FBDGs of the UK, US, and China were incompatible with the climate change, land use, freshwater, and nitrogen targets, and adopting guidelines in line with the EAT-Lancet recommendation could increase the number of avoided deaths from 78 000 (74 000 to 81 000) to 104 000 (96 000 to 112 000) in the UK, from 480 000 (445 000 to 516 000) to 585 000 (523 000 to 646 000) in the USA, and from 1 149 000 (1 095 000 to 1 204 000) to 1 802 000 (1 664 000 to 1 941 000) in China. This analysis concluded that national guidelines could be both healthier and more sustainable. This study is similar to the present study in terms of variables, but different in terms of methodology and specificity of participants. The study of Springmann *et al* (2020) addresses two major variables in the present study (sustainable food consumption and healthy living) on global food based dietary guidelines. The present study employed a correlation survey research design, using close-ended questionnaires to obtain data from civil servants, whereas that of Springmann *et al* (2020) employ a modelling study, a graded coding method was developed and used to extract quantitative recommendations from 85 FBDGS.

Ifeanyichukwu and Nwaizugbo (2020) conducted a study titled Determinants of Sustainable Foods Consumption: Evidence from Nigeria. It was an empirical study that investigates the determinants of sustainable food consumption in Nigeria, focusing on the impacts of dietary/nutritional adequacy, economic, sociocultural, and environmental factors on consumption behavior. A sample of 250 households was drawn from five universities, each representing one of the five South East states of Nigeria. A well-structured questionnaire was utilized to collect data from respondents, and multiple regression analysis (standard and hierarchical) was employed to assess the significance of the model generated for the study. The findings indicate that the independent variables collectively explain 37.9 percent of the

variance in consumption behavior. The study selected 50 households from each of the five South East states of Nigeria, totaling 250 households, with representation from five universities. A well-structured questionnaire was administered to gather relevant data from respondents. Multiple regression analysis, including standard and hierarchical techniques, was employed to analyze the data and evaluate the significance of the model developed for the study. The results reveal that the independent variables collectively account for 37.9 percent of the variance in consumption behavior. This study is similar to the present study in terms of variables, but different in terms of methodology. The study of Ifeanyichukwu and Nwaizugbo (2020) was concerned with one of the two major variables in the present study (sustainable food consumption). The present study employed a correlation survey research design, using close-ended questionnaires to obtain data from civil servants, whereas that of Ifeanyichukwu and Nwaizugbo (2020) was an empirical study and multiple regression analysis (standard and hierarchical) was employed to assess the significance of the model generated for the study.

Pocol, Marinescu, Amuza, Cadar and Rodideal. (2020) study Sustainable vs. unsustainable food consumption behaviour: A study among students from Romania, Bulgaria, and Moldova. The study adopted a survey-based research method from the total sample, 1506 students were from Romania, 433 from Moldova, and 439 from Bulgaria. The authors used different weighting syntaxes for each country, depending on the specifics of the local population. Students entering the investigated target area were selected based on the fact that this segment of the population is an educated one and represents a suitable sample for studying food consumption behaviour. The student's participation in this survey was voluntary. The maximum margin of error was a maximum of +/− 8% at university level and +/− 6% at national level. The data was collected during 2017–2018, and the administration of the questionnaires was blended—both "face to face" and online. The duration of the

application of a questionnaire ranged from 20 to 30 min. The research method was a survey based on a questionnaire administered to a sample of 2378 subjects in the 2017–2018 period. The ANOVA test and simple linear regression were used to identify the correlation between the various variables analysed. The questionnaire included questions related to food consumption behaviour and lifestyle of students, but also socio-demographic questions. Regarding gender, there are small differences in the mixed diet, the percentage being slightly higher among men (93.2%) than among women (87.5%). Instead, in the case of semi-vegetarian, ovo-lacto-vegetarian, and lacto-vegetarian diets, the percentage is slightly higher among women than men. Concerning the respondents' age, we can notice that the percentage of those who have a mixed diet decreases with age, from 92.7% (18–19 years category) to 82.9% (26+ category). An opposite situation is noticed in the case of semi-vegetarian and ovo-lacto-vegetarian diets, where the percentage increases slightly with age. Minimal differences also resulted in the case of associations with the other socio-demographic variables: The percentage of those with a mixed diet is 86.1% (for people under 50 kg) and 94% (for people over 90 kg). The study of Pocol, *et al.* (2020) was concerned with one of the two major variables in the present study (sustainable food consumption). The present study employed a correlation survey research design, using close-ended questionnaires to obtain data from civil servants, whereas that of Pocol, *et al.* (2020) was survey-based research method, ANOVA test and simple linear regression were used to identify the correlation between the various variables analysed.

Esteve-Llorens, Darriba, Moreira, Feijoo and González-García (2019) conducted a study titled "Towards an Environmentally Sustainable and Healthy Atlantic Dietary Pattern: Life Cycle Carbon Footprint and Nutritional Quality". The study aimed to measure the environmental and nutritional sustainability of the Atlantic diet recommendations and real consumption habits in Galicia, Spain. The study used an input-output analysis to collect data,

and the research instruments were Cronbach's alpha and structural equation modeling. The study found that the carbon footprint of the Atlantic diet was moderately high compared to recommended diets such as the Mediterranean one. The study also found that the nutritional quality of the Atlantic diet was comparatively higher than the current Galician diet. the consumption of livestock products and shellfish is responsible for most GHG emissions (70% of the total). The basic ingredients of the AD, such as vegetables and legumes, make a relatively minor contribution (with an impact of 30% of the total) to the total carbon footprint of 3.01 kg CO2eq·person−1 ·day−1. As regards nutritional quality, AD has a high nutritional score (474), mainly due to the low intake of sodium, added sugars and saturated fats (nutrients to be limited in healthy diets). In general, both the carbon footprint and the nutritional index score are consistent with those of other studies on the Mediterranean diet, which has been recognized as beneficial. The study recommended that policymakers should encourage the adoption of the Atlantic diet to promote healthy and sustainable food systems. This study is different from the present study in terms of variables, methodology and specificity of participants. The present study employed a correlation survey research design, using close-ended questionnaires to obtain data from civil servants, whereas that of Esteve-Llorens *et al* (2019) used an input-output analysis to collect data, and the research instruments were Cronbach's alpha and structural equation modeling.

Blackstone, El-Abbadi, McCabe, Griffin and Nelson (2018) carried out modelling study to link sustainability to the healthy eating patterns of the Dietary Guidelines for American. It was a modelling study done at the university of New Hampshire (Durham, NH, USA) The authors analysed the healthy US-style (US), healthy Mediterranean-style (MED), and healthy vegetarian (VEG) patterns recommended in the 2015-20 Dietary Guidelines for Americans. Food groups and subgroups consisted of 321 commonly consumed foods, with group composition predetermined by the US Department of Agriculture. They compiled and used

multiple datasets to assign environmental burdens to foods, focusing on six impact categories of policy importance: global warming potential, land use, water depletion, freshwater and marine eutrophication, and particulate matter or respiratory organics. They did life cycle impact assessments for each of the three diet patterns and compared the six impact categories between the patterns. They also analysed the proportion contribution of the food groups to each impact category in each of the diet patterns. Findings reveal that the US and MED patterns had similar impacts, except for freshwater eutrophication. Freshwater eutrophication was 31% lower in the US pattern than the MED pattern, primarily due to increased seafood in the MED pattern. All three patterns had similar water depletion impacts, with fruits and vegetables as major contributors. For five of the six impacts, the VEG pattern had 42-84% lower burdens than both the US and MED patterns. Reliance on plant-based protein and eggs in the VEG pattern versus emphasis on animal-based protein in the other patterns was a key driver of differences, as was a lower overall protein foods recommendation in the VEG pattern. The study concluded that the recommended patterns in the Dietary Guidelines for Americans might have starkly different impacts on the environment and other dimensions of human health beyond nutrition. Given the scale of influence of the Dietary Guidelines for Americans on food systems, incorporating sustainability into their development has the potential to have great benefit in terms of long-term food security. This study is similar to the present study in terms of variables, but different in terms of methodology. The study of Blackstone *et al* (2018) was concerned with one of the two major variables in the present study (sustainable food consumption). The present study employed a correlation survey research design, using close-ended questionnaires to obtain data from civil servants, whereas that of Blackstone *et al* (2018) employ a modelling study.

Summary of Reviewed Literature

The review of information in literature that are related to the present study began with the discussion of the theoretical framework on which the study is hinged. This study is based on Sustainability Theory put forward by Graham Harlem Brundtland (1987), especially the concept of Sustainable Food Systems (SFS) which is deeply espoused by the organs of the United Nations such as FAO. Next, the concept of civil servants in the present study was examined. The review also discussed the concept of sustainable food consumption, covering issues such as sustainability in diets, global concern over sustainable food consumption, international action for sustainable diets, eco-friendly eating as a form of sustainable food consumption, agriculture and food system in Nigeria, Nigeria's food system challenge, diet composition and quality in Nigeria, affordability of healthy diet in Nigeria, nutritional planning in Nigeria, direct nutrition and health intervention in Nigeria, other strategies for preventing malnutrition in Nigeria, assessing the impact of agriculture on food security in Nigeria, and the challenges of food security in Nigeria.

Thereafter, the concept of healthy living as used in this study was described with reference to the four its three aspects, namely physical health, psychological health, and social health. The relationship between sustainable food consumption and healthy living of civil servants, as well as the influence of demographic characteristics on the relationship between the two variables. Eight related empirical studies were reviewed, and the closest to the present study is that of Kowalsky *et al.* (2022) who studied sustainable diet as tool to harmonize the health of individuals, communities and the planet. However, this present study is more specific in terms of the population covered (civil servants) than the study of Kowalsky *et al.* (2022). The present study explored four aspects of sustainable food consumption and three aspects of healthy living, compared with the exploration of only one aspect of sustainable food consumption (environmental) and one aspect of healthy living (physical) in the study of Kowalsky *et al.* (2022).

Based on the review literature, few studies have been carried out on sustainable food consumption in Nigeria, and none has investigated sustainable food consumption as a correlate of civil servant healthy living. Again, it appears that there is paucity of studies of this kind in the study area. This study intends to fill these gaps.

CHAPTER THREE

METHODOLOGY

This chapter deals with the method to be used in carrying out the study under the following sub-headings:

- Design of the Study
- Population of the Study
- Sample and Sampling Technique
- Instrument for Data Collection
- Validity of the Instrument
- Reliability of the Instrument
- Method of Data Collection
- Method Data Analysis

Design of the Study

The research design adopted for this is correlational survey research design. Correlational research is a type of research method that involves observing two or more variables in order to establish a statistically corresponding relationship between them. (Longe, B. (2020). It was deemed suitable for this study to collate respondents' opinion on sustainable food consumption and healthy living among civil servants in Ekiti state

Population of the Study

The population for the study comprised civil servants in Ekiti State across the three Senatorial districts; Ekiti North, Ekiti Central and Ekiti South. Ekiti State has sixteen Local Government Area with estimated population of 2,398,957 (National Population Commission, 2006).

Sample and Sampling Technique

The sample size for the study was three hundred and ninety-nine (399). This was determined using Taro Yamane formula which helps to select a manageable sample from a large population size while maintaining representativeness.

$$n = \frac{N}{1+N(e)^2} = \frac{3592000}{1+3592000\,(0.05)^2} = \frac{3592000}{8981} = 399.9$$

Where
- n = sample size
- N = finite population (3592000)
- e = level of significance (or permissive margin of error) (0.05)
- 1 = constant

Multistage random sampling technique was used in selecting the samples.

- ***Stage 1 (Selection of Local Government Areas, LGAs):*** One LGA each was randomly selected from each of the three senatorial districts of Ekiti State. The selected LGAs are Ido/Osi, Ado, and Ikere LGAs. 133 respondents were selected from each LGA, as shown in Table 1.
- ***Stage 2 (Selection of Respondents Location):*** From each of the three LGAs, one rural settlement and one urban settlement were randomly selected. This brought about six settlements. Proportionate stratified sampling technique was used to select 40% of respondents from rural settlement and 60% from urban settlement, because urban areas have more population than rural areas. This implies that 53 respondents were selected from each rural settlement and 80 respondents were selected from each urban settlement, as shown in Table 1. That gave a total of 133 respondents from each local government area, totally 399.

Table 1: Selection of Samples by Senatorial Districts, LGAs and Settlements

Senatorial District	Ekiti North	Ekiti Central	Ekiti South
LGA	Ido/Osi	Ado	Ikere
Rural respondents	Usi	Odo-Ado	Ajebamidele
	53	53	53
Urban respondents	Ido	Ado	Ikere
	80	80	80
sub total	133	133	133
Total	399		

Source: Researcher, 2023

Research Instrument

The instrument for the study was self-structured questionnaire designed by the researcher. The questionnaire tittled "Sustainable Food Consumption and Healthy Living Questionnaire among Civil Servants (SEHLCSQ)" was used to elicit information from the respondents. The questionnaire has three sections, A, B and C. Section A elicited information on the demographic information of respondents such as gender, age range, location and socioeconomic status. Section B consisted of nineteen items which measure the four constructs of sustainable food consumption (health, environmental, economic and sociocultural) and Section C consisted of nineteen items which measure the three constructs of healthy living (physical, psychological, and social) among civil servants in Urban in Ekiti State. The items were measured in four point modified Likert scale of Strongly Agree (SA= 4 points), Agree (A= 3 points), Disagree (D = 2 points) and Strongly Disagree (SD = 1 point).

Validity of the Instrument

The Validation of the instruments was carried out by the researcher's supervisor, one lecturer in the department of Vocational and Technical Education and an expert in psychometrics before administration. They pointed out that the terminologies used in the research question should be written in such a way that Civil servant that are not in the field will understand, also name of town/ villages should be removed from the questionnaire, it

was also pointed out that demographic information such as educational level and types of houses should be included in section A of the questionnaire, reduction in the number of items in the instrument was also suggested.

Reliability of the Instrument

The reliability of the instrument was determined by measuring its internal consistency. This was done by administering the instrument on 20 respondents who were not part of the sample of the study. The data obtained from the administration was subject to Cronbach Alpha statistics. A reliability coefficient of 0.79 was obtained indicating high internal consistency of the instrument.

Method of Data Collection

The questionnaire was administered by the researcher with the help of six research assistants who were briefed about the purpose of the study, the researcher visited the sampled schools and a formal introduction to the Principals/Head teachers to sought their consent for administering questionnaires to teachers. Similarly, permission was sought from the Heads of respective departments in government ministry offices to administer the questionnaire to civil servants. Similarly, permission was sought from Matrons in primary health care centers to administer the questionnaire to Nurses. Additionally, the researcher sought approval from the Heads of departments in tertiary institutions to administer the questionnaire to civil servants. The researcher and the assistants met with all the respondents and give each a copy of the questionnaire. The questionnaire as retrieved after the respondents have completely filled it to ensure 100% return rate.

Method of Data Analysis

The data obtained was analyzed with descriptive and inferential statistics, using SPSS version 20. Mean and standard deviation were used to answer the first two research questions. The decision rule is that any mean value equal to or greater than 3.00 for research question one and 2.50 for research question two and three was regarded as high consumption and agreed respectively, any mean value less than 2.50 was regarded as disagreed or low consumption and disagreed respectively. The null hypothesis 1 was tested using Pearson's Product-Moment Correlation (PPMC), the null hypotheses 2–4 were tested using independent t-test statistics, while null hypothesis 5 was tested using one-way Analysis of Variance (ANOVA). For the first null hypothesis, the r-value was used to decide the extent of relationship, such that any r-value between 0.00 – 0.30 was regarded as low correlation, between 0.31 – 0.60 was regarded as moderate correlation, and between 0.61 – 1.00 were regarded as high correlation. For all null hypotheses, the probability value (p) was used to make decision. If the p-value is less than or equal to 0.05, the null hypothesis was rejected, but if p-value is greater than 0.05, the null hypotheses was retained.

CHAPTER FOUR

PRESENTATION OF RESULTS AND DISCUSSION OF FINDINGS

This chapter presents, interprets and discusses the finding from the analysis of data collected for this study.

Presentation of Results

Demographic Information of the Respondents

Table 2: Frequencies and Percentages of the Demographic Information of the Respondents

	Frequency	Percent
Gender		
Male	153	38.5
Female	244	61.5
Total	397	100.0
Age		
18-39 years	183	46.1
40-64 years	214	53.9
Total	397	100.0
Location		
Rural	165	41.6
Urban	232	58.4
Total	397	100.0
Income		
Less than 420,000	99	24.9
421,000 - 1,000,000	171	43.1
Above 1,000,000	127	32.0
Total	397	100.0
Educational Level		
NCE	38	9.6
Degree	270	68.0
Masters	57	14.4
PhD	32	8.1
Total	397	100.0
Housing		
Bungalow	195	49.1
Duplex	86	21.7
Self-contained	109	27.5
Bedsit	7	1.8
Total	397	100.0

Table 2 shows that the larger proportion of the respondents are female (61.5%), between the ages of 40-64 years (53.9%), live in urban (58.4%), earn between 421,000 - 1,000,000 (43.1%), had a highest qualification of a Bachelor's Degree (68.0%), and lived in a bungalow (49.1%).

Research Question 1: What is the prevalent dietary pattern of civil servants in Ekiti State?

Table 3: Mean, Standard Deviation and Ranking of the Prevalent Dietary Pattern of Civil Servants in Ekiti State

SN	Items	$\overline{x}$	SD	Ranking	Decision
1	Cereals	3.35	1.31	3rd	Prevalent
2	Dairy Products	3.25	1.17	4th	Prevalent
3	Meat	3.67	1.16	1st	Prevalent
4	Fruits and Vegetables	3.41	1.15	2nd	Prevalent
5	Legumes	2.79	1.32	6th	Less Prevalent
6	Fats and Oils	3.22	1.22	5th	Prevalent
7	Sugar	2.40	1.41	7th	Less Prevalent
	Total	**3.16**	**1.25**		Prevalent

Keys: $\overline{x}$ = mean, SD = Standard deviation
Source: Field Survey (2024)

Table 3 shows that the most prevalently consumed food groups are meat ($\overline{x}$ = 3.67), fruit and vegetables ($\overline{x}$ = 3.41), and cereals ($\overline{x}$ = 3.35). Other food such as dairy products ($\overline{x}$ = 3.25), fats and oils ($\overline{x}$ = 3.22) are also consumed prevalently. Food groups like legumes ($\overline{x}$ = 2.79) and sugars ($\overline{x}$ = 2.40) have mean values less than the cut-off point of 3.00 and are deemed to be consumed less prevalently. An overall mean value of 3.16 shows a prevalent consumption of diets among civil servants in Ekiti State.

Research Question 2: What is the extent of sustainable food consumption among civil servants in Ekiti State, based on the health, environmental, economic and sociocultural impacts on such eating?

Table 4: Mean and Standard Deviation of the Extent of Sustainable Food Consumption among Civil Servants in Ekiti State, based on the Health, Environmental, Economic and Sociocultural Impacts on such Eating

SN	Items	$\overline{x}$	SD	Decision
Health Component				
1	I always eat nutritious foods that are minimally processed.	3.40	0.61	High Extent
2	My meals are always balanced across food groups.	3.04	0.80	High Extent
3	My diets are primarily plant-based (wholegrains, legumes, nuts and an abundance and variety of fruits and vegetables)	2.89	0.89	High Extent
4	My diets are moderately served	3.01	0.89	High Extent
5	My diets are supplemented by animal-based foods	2.97	0.81	High Extent
6	My major source of fluid is safe and clean water.	3.25	0.83	High Extent
7	My foods contain just enough amount energy and micronutrients that are necessary for good health.	3.03	0.91	High Extent
	Sub-total	**3.03**	**0.82**	**High Extent**
Environmental Component				
8	I prefer that food items are produced with minimal use of hormones (meat, dairy).	3.22	0.74	High Extent
9	I encourage the minimal use of leaves in packaging of rice, moi-moi, pounded yam, corn pudding	3.16	0.75	High Extent
10	It is better to produce food items with minimal use of fertilizers, such as cocoyam, yam, vegetables, fruits and so on.	2.90	0.95	High Extent
11	I eat small quantity of food using product mostly from my farm	2.54	1.09	High Extent
	Sub-total	**2.96**	**0.88**	**High Extent**
Economic Component				
12	I consume foods that are accessible	3.33	0.69	High Extent
13	I consume foods that are affordable.	3.26	0.64	High Extent
14	My family consume foods without straining our present purchasing powers	2.99	0.79	High Extent
15	My family consume foods without straining our future purchasing powers	2.81	1.00	High Extent
	Sub-total	**3.10**	**0.78**	**High Extent**
Sociocultural Component				
16	The foods I consume are safe and can be eaten at social gatherings	3.31	0.78	High Extent
17	The foods I consume are culturally acceptable.	3.19	0.70	High Extent
18	The foods I consume are usually locally-sourced.	3.00	0.81	High Extent
19	My dietary pattern places values on the way food are sourced, produced and consumed	2.94	0.96	High Extent
	Sub-total	**3.05**	**0.80**	**High Extent**
	Total	**3.11**	**0.81**	**High Extent**

Keys: $\overline{x}$ = mean, SD = Standard deviation
Source: Field Survey (2024)

Table 4 shows that there is a high extent of sustainable food consumption among civil servants in Ekiti State, based on the health component ($\overline{x}$ = 3.03), environmental component

(**$\overline{x}$** = 2.96), economic component ($\overline{x}$ = 3.10) and sociocultural components ($\overline{x}$ = 3.05) of the impacts on such eating. An overall mean value of 3.11 indicates that the extent of sustainable food consumption among civil servants in Ekiti State is high.

Research Question 3: What is the extent of healthy living of civil servants in Ekiti State in terms of their physical, psychological and social health?

Table 5: Mean and Standard Deviation of the Extent of Sustainable Food Consumption among Civil Servants in Ekiti State, based on the Health, Environmental, Economic and Sociocultural Impacts on such Eating

SN	Items	$\overline{x}$	SD	Decision
Physical Component				
1	I have adequate physical strength for my age.	3.36	0.67	High Extent
2	The functioning of my body systems is normal.	3.26	0.67	High Extent
3	I do not have any underlying disease or infirmity	3.09	0.85	High Extent
4	I check my body weight regularly in order to consume healthy foods	2.84	0.89	High Extent
5	I sleep for at least eight hours daily	2.86	0.87	High Extent
6	I take enough water to stay hydrated	3.13	0.79	High Extent
7	I am able to exercise my body without stress	2.83	0.88	High Extent
	Sub-total	**3.05**	**0.80**	**High Extent**
Psychological Component				
8	I can think and perceive things soundly.	3.39	0.64	High Extent
9	My mood, affection, emotions are stable.	3.14	0.71	High Extent
10	I have a high problem-solving ability.	2.86	0.89	High Extent
11	My ability to recall information or events is high.	2.99	0.88	High Extent
12	I have strong willpower to stand by my decisions.	3.14	0.84	High Extent
13	I can manage stress effectively	2.92	0.84	High Extent
14	I avoid being depressed	2.96	0.95	High Extent
	Sub-total	**3.06**	**0.82**	**High Extent**
Social Component				
15	I engage in personal hygiene and clean my immediate environment	3.55	0.61	High Extent
16	I am not addicted to alcohol	3.28	0.77	High Extent
17	I do not engage in unsafe and unprotected sexual activities.	3.24	0.82	High Extent
18	I am good at establishing and maintaining relationships with people.	3.14	0.91	High Extent
19	I avoid late night club activities.	3.24	0.91	High Extent
	Sub-total	**3.29**	**0.80**	**High Extent**
	SumTotal	**3.12**	**0.41**	**High Extent**

Keys: $\overline{x}$ = mean, SD = Standard deviation
Source: Field Survey (2024)

Table 5 shows that there is a high extent of healthy living of civil servants in Ekiti State in terms of their physical health ($\overline{x}$ = 3.05), psychological health ($\overline{x}$ = 3.06) and social health ($\overline{x}$ = 3.29). An overall mean value of 3.12 indicates that the extent of healthy among civil servants in Ekiti State is high.

Research Question 4: What is the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State?

Research Hypothesis 1: There is no significant relationship between sustainable food consumption and healthy living of civil servants in Ekiti State.

Table 6: PPMC of the test of the Relationship Between Sustainable Food Consumption and Healthy Living of Civil Servants in Ekiti State

		SE (Health)	SE (Environmental)	SE (Economic)	SE (Sociocultural)	SE (Cluster)
HL (Physical)	r	*0.44	*0.24	*0.32	*0.47	*0.46
	ρ	0.00	0.00	0.00	0.00	0.00
HL (Psychological)	r	*0.39	*0.28	*0.39	*0.34	*0.48
	ρ	0.00	0.00	0.00	0.00	0.00
HL (Social)	r	*0.34	*0.15	*0.36	*0.47	*0.39
	ρ	0.00	0.00	0.00	0.00	0.00
HL (Cluster)	r	*0.48	*0.28	*0.44	*0.52	*0.55
	ρ	0.00	0.00	0.00	0.00	0.00

Source: Field Survey (2024)
Keys: SE = sustainable food consumption, HL = healthy living, r = correlation coefficient, **ρ** = probability value of significance, **α** = 0.05

Table 6 shows that all the components of sustainable food consumption are positively, moderately and significantly correlated all the components of healthy living among the civil servants in Ekiti State. The correlation coefficient was highest between the clustered variables of both sustainable food consumption and healthy living (r = 0.55, ρ = 0.00). Hence, the null hypothesis is rejected. This implies that an improvement in sustainable food consumption practices among civil servants in Ekiti State corresponds to a significant increase in their healthy living.

Research Question 5: What is the difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on age?

Research Hypothesis 2: There is no significant difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on age.

Table 7: Independent Samples t-test of the Difference in the Relationship Between Sustainable Food Consumption and Healthy Living of Civil Servants in Ekiti State Based on Age

Variables	N	$\overline{x}$	SD	T	df	ρ	Decision
18-39 years	183	0.11	0.67	-0.96	395	0.34	Insignificant
40-64 years	214	0.18	0.68				

Source: Field Survey (2024)
Keys: N = number of respondents in group, $\overline{x}$ = mean, SD = Standard deviation, t = calculated t-value, df = degree of freedom, **ρ** = probability value of significance, α = 0.05

Table 7 shows that the obtained ρ-value is greater than the alpha value of 0.05, indicating that the difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on age is not significant. The null hypothesis is therefore accepted. This implies that the extent that sustainable food consumption practices are correlated to healthy living among early adult civil servants in Ekiti State (18-39 years) is slightly less than among middle-aged civil servants (40-64 years), but the difference is not statistically significant.

Research Question 6: What is the difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on gender?

Research Hypothesis 3: There is no significant difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on gender.

Table 8: Independent Samples t-test of the Difference in the Relationship Between Sustainable Food Consumption and Healthy Living of Civil Servants in Ekiti State Based on Gender

Variables	N	$\overline{x}$	SD	T	df	ρ	Decision
Male	153	0.21	0.65	1.55	395	0.12	Insignificant
Female	244	0.11	0.70				

Source: Field Survey (2024)
Keys: N = number of respondents in group, $\overline{x}$ = mean, SD = Standard deviation, t = calculated t-value, df = degree of freedom, **ρ** = probability value of significance, α = 0.05

Table 8 shows that the obtained ρ-value is greater than the alpha value of 0.05, indicating that the difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on gender is not significant. The null hypothesis is therefore accepted. This implies that the extent that sustainable food consumption practices are correlated to healthy living among male civil servants in Ekiti State is slightly less than among female civil servants, but the difference is not statistically significant.

Research Question 7: What is the difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on location?

Research Hypothesis 4: There is no significant difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on location.

Table 9: Independent Samples t-test of the Difference in the Relationship Between Sustainable Food Consumption and Healthy Living of Civil Servants in Ekiti State Based on Location

Variables	N	$\overline{x}$	SD	T	df	ρ	Decision
Rural	165	0.18	0.71	0.92	395	0.36	Insignificant
Urban	232	0.12	0.65				

Source: Field Survey (2024)
Keys: N = number of respondents in group, $\overline{x}$ = mean, SD = Standard deviation, t = calculated t-value, df = degree of freedom, **ρ** = probability value of significance, α = 0.05

Table 9 shows that the obtained ρ-value is greater than the alpha value of 0.05, indicating that the difference in the relationship between sustainable food consumption and

healthy living of civil servants in Ekiti State based on location is not significant. The null hypothesis is therefore accepted. This implies that the extent that sustainable food consumption practices are correlated to healthy living among civil servants in rural parts of Ekiti State is slightly higher than among civil servants in urban areas, but the difference is not statistically significant.

Research Question 8: What is the difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on income level?

Research Hypothesis 5: There is no significant difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on income level.

Table 10: One-Way ANOVA of the Difference in the Relationship Between Sustainable Food Consumption and Healthy Living of Civil Servants in Ekiti State Based on Income Level

Variables	N	$\overline{x}$	SD	SOS	df	F	ρ	Decision
Less than ₦ 420,000	99	0.17	0.71					
₦421,000 - ₦1,000,000	171	0.17	0.70	182.40	396	0.55	0.58	Insignificant
Above ₦1,000,000	127	0.10	0.63					

Source: Field Survey (2024)

Keys: N = number of respondents in group, $\overline{x}$ = mean, SD = standard deviation, SOS = sum of square, **df** = degree of freedom, **F** = computed F-value, **ρ** = probability value of significance, **α** = 0.05

Table 10 shows that the obtained ρ-value is greater than the alpha value of 0.05, indicating that the difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on income level is not significant. The null hypothesis is therefore accepted. This implies that the extent that sustainable food consumption practices are correlated to healthy living is least among civil servants who earn above ₦1,000,000 and the value is almost the same for those who earn lea than ₦420,000 and those who earn between ₦421,000 and ₦1,000,000. However, the difference is not statistically significant.

Discussion of Findings

Findings in answer to the first research question indicate that the most prevalently consumed food groups are meat, fruit and vegetables, and cereals. Other foods such as dairy products, fats and oils are also consumed prevalently. Food groups like legumes and sugars are deemed to be consumed less prevalently. Overall, there is a prevalent consumption of diets among civil servants in Ekiti State. This is in line with the findings of Ihensekhien and Omosanyin (2023) that civil servants in Ekiti State consume fats and oils, fruits and vegetables, cereals, and meat at least once a day, while they consume dairy products, legumes, and sugar about three times per week averagely eat only two adequate meals per day and skip lunch.

Findings in answer to the second research question show that there is a high extent of sustainable food consumption among civil servants in Ekiti State, based on the health component, environmental component, economic component and sociocultural components of the impacts on such eating. Overall, the extent of sustainable food consumption among civil servants in Ekiti State is high. This is in line with the assertion of Biesbroek *et al.* (2023) that sustainable food consumption involves consuming food items that promote every aspect of people's health, with low adverse impact on the environment, are affordable, equitably accessible, and are culturally acceptable.

Findings in answer to the third research question show that there is a high extent of healthy living of civil servants in Ekiti State in terms of their physical health, psychological health and social health. Overall, the extent of healthy among civil servants in Ekiti State is high. This is in line with the findings of Ohi (2023) that physical health can impact psychological health by affecting mood, energy levels, and cognitive function, also Green,

(2023) posited that psychological health can also impact physical health by influencing health behaviors such as diet, exercise, and substance use, lastly Bozek, *et al* (2020) states that social health can impact both physical and psychological health by providing social support, reducing stress, and promoting healthy behaviors.

Findings in answer to the fourth research question and test of the first null hypothesis show that all the components of sustainable food consumption are positively, moderately and significantly correlated all the components of health living among the civil servants in Ekiti State. The correlation coefficient was highest between the clustered variables of both sustainable food consumption and healthy living ($r = 0.55$, $\rho = 0.00$). Hence, the null hypothesis is rejected. This implies that an improvement in sustainable food consumption practices among civil servants in Ekiti State corresponds to a significant increase in their healthy living. This is in line with the findings of Choi, *et al*. (2021) that lifestyle of healthy and sustainability consumers prioritizes promoting a lifestyle of health and sustainability by supporting movements that advocate for local, organic, and low-carbon foods

Findings in answer to the fifth research question and test of the second null hypothesis show that the difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on age is not significant. This implies that the extent that sustainable food consumption practices are correlated to healthy living among early adult civil servants in Ekiti State (18-39 years) is slightly less than among middle-aged civil servants (40-64 years), but the difference is not statistically significant. This is in line with the findings of Dominguez, *et al* (2022) that as people age, they commonly become more vulnerable to chronic conditions, however, by embracing sustainable dietary practices, they may find protection through the delivery of essential nutrients and bioactive substances that support healthy aging.

Findings in answer to the sixth research question and test of the third null hypothesis show the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on gender is not significant. This implies that the extent that sustainable food consumption practices are correlated to healthy living among male civil servants in Ekiti State is slightly less than among female civil servants, but the difference is not statistically significant. This observed inclination towards sustainable food choices among women than men may be attributed to factors such as differences in awareness of health and environmental concerns. Dahal (2022) also highlighted that women are more likely than men to choose plant-based diets and prioritize organic and locally sourced foods.

Findings in answer to the seventh research question and test of the fourth null hypothesis show that the difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on location is not significant. This implies that the extent that sustainable food consumption practices are correlated to healthy living among civil servants in rural parts of Ekiti State is slightly higher than among civil servants in urban areas, but the difference is not statistically significant. This is in line with the findings of Bernsdorf, *et al* (2017) that frequent exposure to establishments offering primarily processed and calorie-dense foods, such as fast-food outlets, takeaways, cafés, restaurants, and convenience stores in urban areas, could encourage and perpetuate unhealthy eating habits.

Findings in answer to the eighth research question and test of the fifth null hypothesis show that the difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on income level is not significant. This implies that the extent that sustainable food consumption practices are correlated to healthy living is least among civil servants who earn above ₦1,000,000 and the value is almost the same for those who earn less than ₦420,000 and those who earn between ₦421,000 and

₦1,000,000. However, the difference is not statistically significant. This is in line with the findings of Biesalski (2016) that economic factors such as income level, availability of resources, and access to markets, may influence the types of food consumed, meal planning, and cooking practices. Navarro-Carrillo *et al.* (2020) and Silva *et al.* (2023) also noted that socio-economic status (SES), encompassing elements like education, income, and profession, plays a pivotal role in promoting both sustainable and health-conscious lifestyles.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter covers the summary of purpose, methodology and findings, conclusion based on findings, implication of findings, recommendations made based on the conclusions and implication, specific contribution to knowledge and suggestions for further studies.

Summary

The study investigated sustainable food consumption as correlate of civil servant healthy living in Ekiti State. Seven (7) research questions were raised and answered in the study. Five null hypotheses were formulated and tested at 0.05 level of significance.

The correlational survey research design was employed for this study. The population for the study comprised of 3,592,000 civil servants in Ekiti State. A sample size of 399 civil servant from the three senatorial districts in Ekiti State were selected to participates in the study. They were selected using a multistage sampling technique. The questionnaire titled "Sustainable food consumption and Healthy Living among Civil Servant Questionnaire" (SEHLCSQ) was developed to elicit information from the respondents. The instrument contained 45 items with a 4- point rating scale made up of four response options of Strongly Agree (SA)=(4), Agree (A)=(3), Disagree (D)=(2) and Strongly Disagree (SD)=(1). The instrument was subjected to content and face validity by the researcher's supervisor and one expert in the department of Vocational and Technical Education and an expert in Psychometrics. The reliability coefficient (0.79) of the instrument was high in terms of internal consistency. Data were collected by administering SEHLCSQ to the respondents. The data collected were analyzed using mean, standard deviation, and independent samples t-test. The null hypothesis 1 was tested using Pearson's Product-Moment Correlation (PPMC),

the null hypotheses 2–4 was tested using independent t-test statistics, while null hypothesis 5 was tested using one-way Analysis of Variance (ANOVA).

The major findings of the study are that:

1. The most prevalently consumed food groups among civil servants are meat, fruit, vegetables, and cereals. Other food such as dairy products, fats and oils are also consumed prevalently. Food groups like legumes and sugars are deemed to be consumed less prevalently.
2. There is a high extent of sustainable food consumption among civil servants in Ekiti State, based on the health component, environmental component, economic component and sociocultural components of the impacts on such eating. Overall, the extent of sustainable food consumption among civil servants in Ekiti State is high.
3. There is a high extent of healthy living among civil servants in Ekiti State in terms of their physical health, psychological health and social health. Overall, the extent of healthy among civil servants in Ekiti State is high.
4. All the components of sustainable food consumption are positively, moderately and significantly correlated to all the components of health living among the civil servants in Ekiti State.
5. The difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on age is not significant
6. The relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on gender is not significant
7. The difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on location is not significant
8. The difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on income level is not significant.

Conclusion

From the findings of this study, it is concluded that sustainable food consumption is a correlate of health living among civil servants in Ekiti State. Specifically, sustainable food consumption is highly prevalent among civil servants in Ekiti State. There is also high extent of healthy living among civil servants in Ekiti State in terms of their physical health, psychological health and social health. All the components of sustainable food consumption are positively, moderately and significantly correlated to all the components of health living among civil servants in Ekiti State. In terms of correlation, the difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on age, gender, location and socio-economic status is not significant.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Civil servants in Ekiti State especially within the ages of 18-35 should engage in a more sustainable way of eating by choosing locally sourced foods.
2. The State Government through her agencies such as National Agency for Food and Drug Administration Control (NAFDAC) should make sure that Food Processing Companies produce food with minimal use of antibiotic.
3. Civil Servants should avoid the use of plastic sand adopt the use of leaves in packaging foods.
4. The State Government through her agencies at intervals should organize, conferences seminars where civil servants will be taught by Nutritionist / Dietician the importance of consuming eco-friendly foods.
5. The State Government through her agencies should encourage farmers to avoid the use of fertilizers in planting food crops.

6. Civil servants should choose plant-based foods by shopping from local farmers

Implications of Findings to Home Economics

The findings of this study imply that:

1. Home Economists at all level will help facilitate healthy living by providing the necessary knowledge and skills to adopt sustainable food consumption practices.
2. Home Economist should integrate into their courses sustainable food consumption practices which will foster healthy living among students because they are likely to become civil servants.

Contributions to Knowledge

This study has contributed to knowledge in the following ways.

1. The study has identified the prevalent dietary pattern among civil servants in Ekiti
2. The study has identified the extent of sustainable food consumption among civil servants in Ekiti State, based on the health, environmental, economic and sociocultural impacts on such eating.
3. The study has identified the extent of healthy living of civil servants in Ekiti State in terms of their physical, psychological and social health.
4. The study has established the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on age
5. The study has established the difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on gender,
6. The study has established the difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on location.
7. The study has established the difference in the relationship between sustainable food consumption and healthy living of civil servants in Ekiti State based on income level.

Suggestions for Further Studies

Further studies can be carried out in the following areas:

1. Exploring the role of sustainable food consumption as correlate of undergraduate student healthy living.
2. Examining and addressing the impacts of sustainable food consumption on the health of civil servant
3. Examining the long-term impacts of physical, psychological and sociocultural component of sustainable food consumption on the overall health of civil servant.
4. The role of government in promoting sustainable food consumption practices among civil servants.
5. Sustainable food consumption habit as correlate of civil servants health status.

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APPENDIX A

DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION
FACULTY OF EDUCATION
UNIVERSITY OF BENIN, BENIN CITY, EDO STATE

SUSTAINABLE FOOD CONSUMPTION AND HEALTHY LIVING AMONG CIVIL SERVANTS' QUESTIONNAIRE (SEHLCSQ)

Dear respondent,

The questionnaire is aimed at seeking your honest opinion about the statements below. The data collected will be treated in strict confidence and will be used purely for research purposes only. Your cooperation is very much appreciated.

Omosanyin Olayemi (Researcher).

SECTION A: Demographic Information

Please tick like this (√)or write correct response as applicable to each of the following.

Gender: ☐ Male ☐ Female **Age**: ☐ 18 – 39 years ☐ 40 – 64 years

Location: ☐ Rural ☐ Urban

Income per annum: ☐ Less than ₦420,000 ☐ ₦421,000–₦1,000,000 ☐ Above ₦1,000,000

Educational level: ☐ NCE ☐ Degree ☐ Masters ☐ Ph.D.

Types of Houses: ☐ Bungalow ☐ Duplex ☐ Self-contained ☐ Bedsit

SECTION B: Dietary Pattern

Please indicate the frequency with which you consumed food items from the following food groups before the pandemic, during it, and afterwards such as now.

SN	Food Group	*More than 1 serving per day*	*Once everyday*	*3 times per week*	*Less than 2 times per week*	*Scarcely*
1	Cereals					
2	Dairy Products					
3	Meat					
4	Fruits and Vegetables					
5	Legumes					
6	Fats and Oils					
7	Sugar					

SECTION C: Sustainable Food Consumption

Health Component of Sustainable Food Consumption					
SN	**ITEMS**	**SA**	**A**	**D**	**SD**
1	I always eat nutritious foods that are minimally processed.				
2	My meals are always balanced across food groups.				
3	My diets are primarily plant-based (wholegrains, legumes, nuts and an abundance and variety of fruits and vegetables)				
4	My diets are moderately served				
5	My diets are supplemented by animal-based foods				
6	My major source of fluid is safe and clean water.				
7	My foods contain just enough amount energy and micronutrients that are necessary for good health.				
Environmental Component of Sustainable Food Consumption					
SN	**ITEMS**	**SA**	**A**	**D**	**SD**
8	I prefer that food items are produced with minimal use of hormones (meat, dairy).				
9	I encourage the minimal use of leaves in packaging of rice, moi-moi, pounded yam, corn pudding				
10	It is better to produce food items with minimal use of fertilizers, such as cocoyam, yam, vegetables, fruits and so on.				
11	I eat small quantity of food using product mostly from my farm				

Economic Component of Sustainable Food Consumption					
SN	**ITEMS**	**SA**	**A**	**D**	**SD**
12	I consume foods that are accessible				
13	I consume foods that are affordable.				
14	My family consume foods without straining our present purchasing powers				
15	My family consume foods without straining our future purchasing powers				
Sociocultural Component of Sustainable Food Consumption					
SN	**ITEMS**	**SA**	**A**	**D**	**SD**
16	The foods I consume are safe and can be eaten at social gatherings				
17	The foods I consume are culturally acceptable.				
18	The foods I consume are usually locally-sourced.				
19	My dietary pattern places values on the way food are sourced, produced and consumed				

SECTION D: Healthy Living

Physical Component of Healthy Living					
SN	**ITEMS**	**SA**	**A**	**D**	**SD**
1	I have adequate physical strength for my age.				
2	The functioning of my body systems is normal.				
3	I do not have any underlying disease or infirmity				
4	I check my body weight regularly in order to consume healthy foods				
5	I sleep for at least eight hours daily				
6	I take enough water to stay hydrated				
7	I am able to exercise my body without stress				
Psychological Component of Healthy Living					
SN	**ITEMS**	**SA**	**A**	**D**	**SD**
8	I can think and perceive things soundly.				
9	My mood, affection, emotions are stable.				
10	I have a high problem-solving ability.				
11	My ability to recall information or events is high.				
12	I have strong willpower and ability to stand by my decisions.				
13	I can manage stress effectively				
14	I avoid being depressed				
Social Component of Healthy Living					
SN	**ITEMS**	**SA**	**A**	**D**	**SD**
15	I engage in personal hygiene and clean my immediate environment				
16	I am not addicted to alcohol				
17	I do not engage in unsafe and unprotected sexual activities.				
18	I am good at establishing and maintaining relationships with people.				
19	I avoid late night club activities.				

Thank you for your cooperation.

APPENDIX B

VALIDATION OF RESEARCH INSTRUMENT

Dept. of Voc. and Tech. Education,
Faculty of Education,
University of Benin, Benin City.

February 6, 2024.

DR. PRAISE ALEOSUM

Dear Sir/Ma,

REQUEST FOR VALIDATION OF RESEARCH INSTRUMENT

I, Olayemi OMOSANYIN (PG/EDU2015285), am a Master's Degree candidate in the above-named Department. I hereby write to solicit for your assistance with the face and content validation of the research instrument to be used as treatment in my ongoing research, titled, "Relationship between sustainable eating and healthy living among civil servants in Ekiti state."

You are required to check if the items in the instruments are properly written appropriate for the constructs to be measured. Information about the purpose, questions, hypotheses, method of data analysis and instruments for the study are also provided.

Thank you in anticipation of your favourable disposition to this request.

Yours faithfully,

Olayemi OMOSANYIN
+2348101509382

DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION
FACULTY OF EDUCATION
UNIVERSITY OF BENIN, BENIN CITY, EDO STATE

SUSTAINABLE EATING AND HEALTHY LIVING AMONG CIVIL SERVANTS QUESTIONNAIRE (SEHLCSQ)

Dear respondent,
The questionnaire is aimed at seeking your honest opinion about the statements below. The data collected will be treated in strict confidence and will be used purely for research purposes only. Your cooperation is very much appreciated.
Omosanyin Olayemi (Researcher).

SECTION A: Demographic Information

Please tick like this (√)or write correct response as applicable to each of the following.

Gender: ☐ Male ☐ Female **Age:** ☐ 18 – 39 years ☐ 40 – 60 years

Location: ☐ Rural ☐ Urban **Name of Town/Village:** _____

Income per annum: ☐ Less than ₦360,000 ☐ ₦361,000–₦1,000,000 ☐ Above ₦1,000,000

SECTION B: Dietary Pattern

Please indicate the frequency with which you consumed food items from the following food groups before the pandemic, during it, and afterwards such as now.

SN	Food Group	*More than 1 serving per day*	*Once everyday*	*3 times per week*	*Less than 2 times per week*	*Scarcely*
1	Cereals					
2	Dairy Products					
3	Meat					
4	Fruits and Vegetables					
5	Legumes					
6	Fats and Oils					
7	Sugar					

SECTION C: Sustainable Eating

Health Component of Sustainable Eating					
SN	**ITEMS**	**SA**	**A**	**D**	**SD**
1	I always eat nutritious foods that are minimally processed.				
2	My meals are always balanced across food groups.				
3	My diets are primarily plant-based (wholegrains, legumes, nuts and an abundance and variety of fruits and vegetables)				
4	My diets are moderate				
5	My diets are supplemented by animal-based foods				
6	My major source of fluid is safe and clean water.				
7	My foods contain just enough amount energy and micronutrients that are necessary for good health.				

Environmental Component of Sustainable Eating					
SN	ITEMS	SA	A	D	SD
8	I prefer that food items are produced with minimal use of antibiotic and hormones.				
9	I encourage the minimal use of leaves in packaging of rice, moi-moi, pounded yam, corn pudding				
10	It is better to produce food items with minimal use of fertilizers, such as cocoyam, yam, vegetables, fruits and so on.				
11	I practice portion control using product mostly from my farm				

Economic Component of Sustainable Eating					
SN	ITEMS	SA	A	D	SD
12	I consume foods that are accessible				
13	I consume foods that are affordable.				
14	My family consume foods without straining our present and future economic powers				
15	The food I consume do not affect the economic condition of people around me.				
Sociocultural Component of Sustainable Eating					
SN	ITEMS	SA	A	D	SD
16	The foods I consume are safe for socialization.				
17	The foods I consume are culturally acceptable.				
18	The foods I consume are usually locally-sourced.				
19	My dietary pattern places values on the way food is sourced, produced and consumed				

SECTION D: Healthy Living

Physical Component of Healthy Living					
SN	ITEMS	SA	A	D	SD
1	I have adequate physical strength for my age.				
2	The functioning of my body systems is normal.				
3	I do not have any underlying disease or infirmity				
4	I check my body weight regularly in order to consume healthy foods				
5	I sleep for at least eight hours daily				
6	I take enough water to stay hydrated				
7	I am able to exercise my body without stress				
Psychological Component of Healthy Living					
SN	ITEMS	SA	A	D	SD
8	I can think and perceive things soundly.				
9	My mood, affection, emotions are stable.				
10	I have a high problem-solving ability.				
11	My ability to recall information or events is high.				
12	I have strong willpower and ability to stand by my decisions.				
13	I can manage stress effectively				
14	I avoid being depressed				

Social Component of Healthy Living					
SN	ITEMS	SA	A	D	SD
15	I engage in personal hygiene and clean my immediate environment				
16	I am not addicted to alcohol				
17	I do not engage in unsafe and unprotected sexual activities.				
18	I am good at establishing and maintaining relationships with people.				
19	I avoid late night club activities.				

Thank you for your cooperation.

Not other indices to measure SES, only income cannot measure it.

The instrument is considered valid subject to corrections made.

06-02-2024

write out in Full.

Dept. of Voc. and Tech. Education,

Faculty of Education,

University of Benin, Benin City.

February 6, 2024.

PROF. N. I MUAGAH

Dear Sir/Ma,

REQUEST FOR VALIDATION OF RESEARCH INSTRUMENT

I, Olayemi OMOSANYIN (PG/EDU2015285), am a Master's Degree candidate in the above-named Department. I hereby write to solicit for your assistance with the face and content validation of the research instrument to be used as treatment in my ongoing research, titled, "Relationship between sustainable eating and healthy living among civil servants in Ekiti state."

You are required to check if the items in the instruments are properly written appropriate for the constructs to be measured. Information about the purpose, questions, hypotheses, method of data analysis and instruments for the study are also provided.

Thank you in anticipation of your favourable disposition to this request.

Yours faithfully,

Where is the purpose of the study? You can not get your research questions with purpose or objective of the study. You may have to start this all over.

Olayemi OMOSANYIN

+2348101509382

Research Questions

The following research questions were raised to guide the study.

1. What is the prevalent dietary pattern of civil servants in Ekiti State?
2. What is the extent of sustainable eating among civil servants in Ekiti State, based on the health, environmental, economic and sociocultural impacts on such eating?
3. What is the extent of healthy living of civil servants in Ekiti State in terms of their physical, psychological and spiritual health?
4. What is the relationship between sustainable eating and healthy living of civil servants in Ekiti State?
5. What is the difference in the relationship between sustainable eating and healthy living of civil servants in Ekiti State based on age?
6. What is the difference in the relationship between sustainable eating and healthy living of civil servants in Ekiti State based on gender?
7. What is the difference in the relationship between sustainable eating and healthy living of civil servants in Ekiti State based on location?
8. What is the difference in the relationship between sustainable eating and healthy living of civil servants in Ekiti State based on socio-economic status?

Research Hypotheses

Research Questions 4 – 8 were hypothesized, and will be tested at 0.05 level of significance.

1. There is no significant relationship between sustainable eating and healthy living of civil servants in Ekiti State.
2. There is no significant difference in the relationship between sustainable eating and healthy living of civil servants in Ekiti State based on age.

DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION
FACULTY OF EDUCATION
UNIVERSITY OF BENIN, BENIN CITY, EDO STATE

SUSTAINABLE EATING AND HEALTHY LIVING AMONG CIVIL SERVANTS QUESTIONNAIRE (SEHLCSQ)

Dear respondent,
The questionnaire is aimed at seeking your honest opinion about the statements below. The data collected will be treated in strict confidence and will be used purely for research purposes only. Your cooperation is very much appreciated.
Omosanyin Olayemi (Researcher). Thank you.

SECTION A: Demographic Information

Please tick like this (√)or write correct response as applicable to each of the following.

Gender: ☐ Male ☐ Female **Age:** ☐ 18 – 39 years ☐ 40 – 60 years

Location: ☐ Rural ☐ Urban **~~Name of Town/Village:~~** Not needed

Income per annum: ☐ Less than ₦360,000 ☐ ₦361,000–₦1,000,000 ☐ Above ₦1,000,000

SECTION B: Dietary Pattern

Please indicate the frequency with which you consumed food items from the following food groups before the pandemic, during it, and afterwards such as now.

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4	Fruits and Vegetables					
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7	Sugar					

SECTION C: Sustainable Eating

Health Component of Sustainable Eating					
SN	**ITEMS**	**SA**	**A**	**D**	**SD**
1	I always eat nutritious foods that are minimally processed.				
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4	My diets are moderate serving				
5	My diets are supplemented by animal-based foods				
6	My major source of fluid is safe and clean water.				
7	My foods contain just enough amount energy and micronutrients that are necessary for good health.				

Environmental Component of Sustainable Eating					
SN	ITEMS	SA	A	D	SD
8	I prefer that food items are produced with minimal use of antibiotic and hormones. how? Do you use them to produce food?				
9	I encourage the minimal use of leaves in packaging of rice, moi-moi, pounded yam, corn pudding				
10	It is better to produce food items with minimal use of fertilizers, such as cocoyam, yam, vegetables, fruits and so on.				
11	I practice portion control using product mostly from my farm				

portion what?

Economic Component of Sustainable Eating					
SN	ITEMS	SA	A	D	SD
12	I consume foods that are accessible				
13	I consume foods that are affordable.				
14	My family consume foods without straining our present and future economic powers				
15	The food I consume do not affect the economic condition of people around me. how do you mean?				
Sociocultural Component of Sustainable Eating					
SN	ITEMS	SA	A	D	SD
16	The foods I consume are safe for socialization. how?				
17	The foods I consume are culturally acceptable.				
18	The foods I consume are usually locally-sourced.				
19	My dietary pattern places values on the way food is sourced, produced and consumed				

SECTION D: Healthy Living

Physical Component of Healthy Living					
SN	ITEMS	SA	A	D	SD
1	I have adequate physical strength for my age.				
2	The functioning of my body systems is normal.				
3	I do not have any underlying disease or infirmity				
4	I check my body weight regularly in order to consume healthy foods				
5	I sleep for at least eight hours daily				
6	I take enough water to stay hydrated				
7	I am able to exercise my body without stress				
Psychological Component of Healthy Living					
SN	ITEMS	SA	A	D	SD
8	I can think and perceive things soundly.				
9	My mood, affection, emotions are stable.				
10	I have a high problem-solving ability.				
11	My ability to recall information or events is high.				
12	I have strong willpower and ability to stand by my decisions.				
13	I can manage stress effectively				
14	I avoid being depressed				

Social Component of Healthy Living					
SN	ITEMS	SA	A	D	SD
15	I engage in personal hygiene and clean my immediate environment				
16	I am not addicted to alcohol				
17	I do not engage in unsafe and unprotected sexual activities.				
18	I am good at establishing and maintaining relationships with people.				
19	I avoid late night club activities.				

Thank you for your cooperation.

These can form each of the purpose of the study. Then turn all the purposes into research question.

06/02/2024

APPENDIX C

RELIABILITY OF RESEARCH INSTRUMENT

```
RELIABILITY
  /VARIABLES=Gender_1 Age_1 Location_1 Income_1 Education_1 HouseType_1
B1_1 B2_1 B3_1 B4_1 B5_1 B6_1 B7_1 C1_1 C2_1 C3_1 C4_1 C5_1 C6_1 C7_1 C8_1
C9_1 C10_1 C11_1 C12_1 C13_1 C14_1 C15_1 C16_1 C17_1 C18_1 C19_1 D1_1 D2_1
D3_1 D4_1 D5_1 D6_1 D7_1 D8_1
D9_1 D10_1 D11_1 D12_1 D13_1 D14_1 D15_1 D16_1 D17_1 D18_1 D19_1
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /SUMMARY=TOTAL.
```

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	20	100.0
	Excluded[a]	0	.0
	Total	20	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.792	51

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SMEAN(Gender)	153.2906	158.081	*-.213	.797
SMEAN(Age)	153.1518	154.983	.053	.793
SMEAN(Location)	152.8462	157.511	*-.320	.795
SMEAN(Income)	152.8018	148.899	.271	.788
SMEAN(Education)	152.9018	153.782	.097	.792
SMEAN(HouseType)	153.5129	154.826	.022	.795
SMEAN(B1)	152.2518	161.155	*-.221	.810
SMEAN(B2)	152.1018	149.423	.128	.796
SMEAN(B3)	150.8518	165.480	*-.331	.817
SMEAN(B4)	151.2702	158.388	*-.161	.801
SMEAN(B5)	151.9018	150.674	.130	.794
SMEAN(B6)	152.3228	142.595	.305	.788
SMEAN(B7)	153.0070	148.895	.157	.794
SMEAN(C1)	151.7518	150.516	.257	.788
SMEAN(C2)	152.0018	149.561	.324	.787
SMEAN(C3)	151.7518	143.207	.523	.779
SMEAN(C4)	151.4518	153.078	.192	.790
SMEAN(C5)	152.2518	155.187	*-.009	.797
SMEAN(C6)	151.2518	150.329	.433	.786
SMEAN(C7)	151.6386	148.818	.422	.785
SMEAN(C8)	151.6240	150.646	.193	.790
SMEAN(C9)	151.6518	154.895	.042	.793
SMEAN(C10)	151.8518	149.471	.217	.790

SMEAN(C11)	152.2518	146.779	.359	.785
SMEAN(C12)	151.4018	145.049	.708	.778
SMEAN(C13)	151.5018	145.650	.588	.780
SMEAN(C14)	151.7518	146.852	.463	.783
SMEAN(C15)	151.9518	146.739	.356	.785
SMEAN(C16)	151.4518	148.637	.459	.784
SMEAN(C17)	151.5018	149.201	.514	.784
SMEAN(C18)	151.2518	148.645	.577	.783
SMEAN(C19)	152.0018	142.379	.507	.779
SMEAN(D1)	151.2518	148.224	.613	.783
SMEAN(D2)	151.7518	141.349	.572	.776
SMEAN(D3)	151.7018	143.267	.509	.779
SMEAN(D4)	152.2518	150.580	.227	.789
SMEAN(D5)	152.2018	157.560	*-.110	.802
SMEAN(D6)	151.4518	152.672	.225	.790
SMEAN(D7)	151.6018	148.032	.457	.784
SMEAN(D8)	151.4018	151.451	.264	.789
SMEAN(D9)	151.4018	147.501	.536	.782
SMEAN(D10)	152.1518	162.178	*-.312	.807
SMEAN(D11)	151.8018	145.846	.447	.782
SMEAN(D12)	151.7018	150.561	.276	.788
SMEAN(D13)	151.7018	146.741	.507	.782
SMEAN(D14)	151.4518	153.119	.153	.791
SMEAN(D15)	151.2518	146.960	.722	.781
SMEAN(D16)	151.4018	147.565	.374	.785
SMEAN(D17)	151.4018	146.312	.619	.780
SMEAN(D18)	151.4518	152.707	.153	.791
SMEAN(D19)	151.2518	144.403	.677	.778

* Editing or deleting asterisked items will improve the internal consistency of the instrument.

APPENDIX D

OUTPUT OF DATA ANALYSIS

Frequencies

```
FREQUENCIES VARIABLES=Gend Age Loc Inco Edu Hou
  /ORDER=ANALYSIS.

[DataSet1] C:\Users\DELL\Documents\FERANMI\CHARIS DATA SERVICES\Mrs
Olayemi\Thesis Analysis.sav
```

Gend

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	153	38.5	38.5	38.5
	Female	244	61.5	61.5	100.0
	Total	397	100.0	100.0	

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-39 years	183	46.1	46.1	46.1
	40-64 years	214	53.9	53.9	100.0
	Total	397	100.0	100.0	

Loc

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Rural	165	41.6	41.6	41.6
	Urban	232	58.4	58.4	100.0
	Total	397	100.0	100.0	

Inco

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 420,000	99	24.9	24.9	24.9
	421,000 - 1,000,000	171	43.1	43.1	68.0
	Above 1,000,000	127	32.0	32.0	100.0
	Total	397	100.0	100.0	

Edu

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NCE	38	9.6	9.6	9.6
	Degree	270	68.0	68.0	77.6
	Masters	57	14.4	14.4	91.9
	PhD	32	8.1	8.1	100.0
	Total	397	100.0	100.0	

Hou

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bungalow	195	49.1	49.1	49.1
	Duplex	86	21.7	21.7	70.8
	Self-contained	109	27.5	27.5	98.2
	Bedsit	7	1.8	1.8	100.0
	Total	397	100.0	100.0	

Descriptives

```
DESCRIPTIVES VARIABLES=DP1 DP2 DP3 DP4 DP5 DP6 DP7 SE1 SE2 SE3 SE4 SE5 SE6
SE7 SE8 SE9 SE10 SE11 SE12 SE13 SE14 SE15 SE16 SE17 SE18 SE19 HL1 HL2 HL3
HL4 HL5 HL6 HL7 HL8 HL9 HL10 HL11 HL12 HL13 HL14 HL15 HL16 HL17 HL18 HL19
SE HL
  /STATISTICS=MEAN STDDEV.


[DataSet1] C:\Users\DELL\Documents\FERANMI\CHARIS DATA SERVICES\Mrs
Olayemi\Thesis Analysis.sav
```

Descriptive Statistics

	N	Mean	Std. Deviation
DP1	397	3.3526	1.31486
DP2	397	3.2469	1.16538
DP3	397	3.6675	1.16354
DP4	397	3.4131	1.15059
DP5	397	2.7935	1.31720
DP6	397	3.2166	1.21996
DP7	397	2.3955	1.40608
SE1	397	3.3955	.61322
SE2	397	3.0428	.79815
SE3	397	2.8942	.89267
SE4	397	3.0050	.89045
SE5	397	2.9723	.81448
SE6	397	3.2494	.82925
SE7	397	3.0277	.91106
SE8	397	3.2166	.73747
SE9	397	3.1637	.75270
SE10	397	2.8967	.95183
SE11	397	2.5390	1.08554
SE12	397	3.3325	.68922
SE13	397	3.2645	.63808
SE14	397	2.9874	.78647
SE15	397	2.8111	.99599
SE16	397	3.3073	.78256
SE17	397	3.1864	.70390
SE18	397	2.9975	.81494
SE19	397	2.9446	.95977
HL1	397	3.3602	.67325
HL2	397	3.262	.6681
HL3	397	3.0932	.85214
HL4	397	2.8413	.89471
HL5	397	2.8589	.86763
HL6	397	3.1285	.79208
HL7	397	2.8312	.87861
HL8	397	3.3854	.64361
HL9	397	3.1436	.70856
HL10	397	2.8589	.88777
HL11	397	2.9899	.87899
HL12	397	3.1385	.83994
HL13	397	2.9169	.83524
HL14	397	2.9597	.94995
HL15	397	3.5516	.60759
HL16	397	3.2771	.76792
HL17	397	3.2393	.82307
HL18	397	3.1436	.90846
HL19	397	3.2418	.91396
SE	397	3.0912	.32339
HL	397	3.1183	.40748
Valid N (listwise)	397		

```
CORRELATIONS
  /VARIABLES=SE_hea SE_env SE_eco SE_soc HL_phy HL_psy HL_Soc SE HL
  /PRINT=TWOTAIL NOSIG
  /STATISTICS DESCRIPTIVES
  /MISSING=PAIRWISE.
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Correlations

		SE_hea	SE_env	SE_eco	SE_soc	HL_phy	HL_psy	HL_Soc	SE	HL
SE_hea	Pearson Correlation	1	.350**	.338**	.335**	.438**	.392**	.338**	.698**	.479**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000
	N	397	397	397	397	397	397	397	397	397
SE_env	Pearson Correlation	.350**	1	.397**	.304**	.235**	.278**	.151**	.577**	.276**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.003	.000	.000
	N	397	397	397	397	397	397	397	397	397
SE_eco	Pearson Correlation	.338**	.397**	1	.526**	.321**	.392**	.358**	.586**	.437**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.000
	N	397	397	397	397	397	397	397	397	397
SE_soc	Pearson Correlation	.335**	.304**	.526**	1	.469**	.344**	.472**	.602**	.519**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000	.000
	N	397	397	397	397	397	397	397	397	397
HL_phy	Pearson Correlation	.438**	.235**	.321**	.469**	1	.583**	.447**	.462**	.838**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000	.000
	N	397	397	397	397	397	397	397	397	397
HL_psy	Pearson Correlation	.392**	.278**	.392**	.344**	.583**	1	.468**	.482**	.853**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000	.000
	N	397	397	397	397	397	397	397	397	397
HL_Soc	Pearson Correlation	.338**	.151**	.358**	.472**	.447**	.468**	1	.385**	.755**
	Sig. (2-tailed)	.000	.003	.000	.000	.000	.000		.000	.000
	N	397	397	397	397	397	397	397	397	397
SE	Pearson Correlation	.698**	.577**	.586**	.602**	.462**	.482**	.385**	1	.545**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000		.000
	N	397	397	397	397	397	397	397	397	397
HL	Pearson Correlation	.479**	.276**	.437**	.519**	.838**	.853**	.755**	.545**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	
	N	397	397	397	397	397	397	397	397	397

**. Correlation is significant at the 0.01 level (2-tailed).

T-Test

```
[DataSet1] C:\Users\DELL\Documents\FERANMI\CHARIS DATA SERVICES\Mrs Olayemi\Thesis Analysis.sav

T-TEST GROUPS=Gend(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=Correl
  /CRITERIA=CI(.95).
```

Group Statistics

	Gend	N	Mean	Std. Deviation	Std. Error Mean
Correl	Male	153	.21421732550	.647298516372	.052330983418
	Female	244	.10608550585	.695708480239	.044538171576

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Correl	Equal variances assumed	2.526	.113	1.548	395	.122	.108131819648	.069864592568	-.029221121609	.245484760906
	Equal variances not assumed			1.574	340.276	.117	.108131819648	.068718123904	-.027033983540	.243297622836

T-Test

```
[DataSet1] C:\Users\DELL\Documents\FERANMI\CHARIS DATA SERVICES\Mrs Olayemi\Thesis Analysis.sav

T-TEST GROUPS=Age(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=Correl
  /CRITERIA=CI(.95).
```

Group Statistics

	Age	N	Mean	Std. Deviation	Std. Error Mean
Correl	18-39 years	183	.11238637574	.674369267012	.049850810665
	40-64 years	214	.17800657695	.682468888231	.046652612763

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Correl	Equal variances assumed	.024	.877	-.960	395	.338	-.065620201216	.068339527590	-.199974883229	.068734480798
	Equal variances not assumed			-.961	386.851	.337	-.065620201216	.068275688218	-.199858066155	.068617663724

T-Test

```
[DataSet1] C:\Users\DELL\Documents\FERANMI\CHARIS DATA SERVICES\Mrs Olayemi\Thesis Analysis.sav

T-TEST GROUPS=Loc(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=Correl
  /CRITERIA=CI(.95).
```

Group Statistics

	Loc	N	Mean	Std. Deviation	Std. Error Mean
Correl	Rural	165	.18470929769	.711076465024	.055357227724
	Urban	232	.12147879357	.654959489585	.043000197123

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Correl	Equal variances assumed	3.979	.047	.915	395	.361	.063230504118	.069129796425	-.072677836837	.199138845072
	Equal variances not assumed			.902	335.022	.368	.063230504118	.070095931507	-.074653109433	.201114117669

Oneway

```
[DataSet1] C:\Users\DELL\Documents\FERANMI\CHARIS DATA SERVICES\Mrs Olayemi\Thesis Analysis.sav

ONEWAY Correl BY Inco
  /MISSING ANALYSIS
  /POSTHOC=LSD ALPHA(0.05).
```

ANOVA

Correl

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.505	2	.253	.547	.579
Within Groups	181.896	394	.462		
Total	182.401	396			

Descriptives

Correl

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Less than 420,000	99	.16788209398	.710358904674	.071393756160	.02620350842	.30956067954	-1.000000000	.999485993
421,000 - 1,000,000	171	.17462556885	.695243991852	.053166636870	.06967373938	.27957739832	-1.000000000	1.000000000
Above 1,000,000	127	.09589617835	.631655121646	.056050328390	-.01502577376	.20681813047	-1.000000000	.998136709
Total	397	.14775847413	.678682068991	.034062076638	.08079336447	.21472358378	-1.000000000	1.000000000

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Correl

LSD

(I) Inco	(J) Inco	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Less than 420,000	421,000 - 1,000,000	-.006743474868	.085808421807	.937	-.17544310684	.16195615711
	Above 1,000,000	.071985915625	.091095819410	.430	-.10710875696	.25108058822
421,000 - 1,000,000	Less than 420,000	.006743474868	.085808421807	.937	-.16195615711	.17544310684
	Above 1,000,000	.078729390494	.079592455128	.323	-.07774963109	.23520841208
Above 1,000,000	Less than 420,000	-.071985915625	.091095819410	.430	-.25108058822	.10710875696
	421,000 - 1,000,000	-.078729390494	.079592455128	.323	-.23520841208	.07774963109