

Mechanism to Sustainably Reduce Malnutrition for Urban Households in Johannesburg

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of Business Administration

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Declaration

I, _Natalie Venter_____, declare that this social entrepreneurship project is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the Graduate School of Business Administration, University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Natalie Venter

Signed at

On the day of 20.....

Wordcount: 16 437 (14 193 + 2 246 References and Appendices)

Dedication

To my daughter, Ashley, thank you for your patience and support. We look forward to spending spontaneous times and outings together again as we did before, prior to my tackling this paper and you had to share my attention with my paper.

Acknowledgements

This paper would not be complete without acknowledging my supervisor, Dr Robert Venter. I wish to thank him for his assistance and support as well as Minette Smit who provided proof reading support.

Table of Contents

Declaration.....	2
Dedication.....	3
Acknowledgements.....	4
Table of Contents	5
List of Tables	7
List of Figures	8
Executive Summary	10
Overview.....	11
Research Problem	15
Delimitations of the Study.....	17
Definitions	17
Section 1: Determinants and Consequences Of Malnutrition	19
Determinates of Malnutrition	19
<i>Basic Causes: Institutions and Malnutrition</i>	20
<i>Underlying Causes: Household Determinants of Malnutrition</i>	27
Availability	28
Access	28
Utilisation	31
Inadequate Care, Health Services and Unhealthy Household Environments	31
<i>Immediate Causes at an Individual Level</i>	32
<i>Consequences of Malnutrition</i>	33
<i>Conclusion</i>	36
Section 2: Mechanisms to Sustainably Reduce Malnutrition.....	37
Introduction.....	37
Institutions and Human Capital	42
<i>Institutional Entrepreneur</i>	44
<i>Social Entrepreneurs</i>	47
<i>Business Entrepreneur</i>	49
Conclusion	49
Overall Conclusion.....	50

Section 3: Research Methodology	52
Introduction	52
Research Paradigm	52
<i>Primary Research Assumptions</i>	52
<i>Research Strategy</i>	54
<i>Research Design</i>	55
Procedures and Methods	56
Data Collection Instrument	56
<i>Targeting and Selecting Respondents</i>	56
Target Polulation	56
Sample Selection	58
Pilot study	59
Research-ethics Ethical Considerations	60
Data Collection and Storage	61
Data Processing and Analysis	61
Reliability and Validity	62
<i>Reliability</i>	62
<i>Validity</i>	62
Section 4: Data Analysis	64
Section 5: Development entrepreneurship business model	69
Introduction	69
Business Plan	73
<i>Executive Summary</i>	73
<i>Vision</i>	74
<i>Market</i>	74
<i>Description of Services</i>	75
References	77
Appendices	87

List of Tables

Table 1	<i>Overview of Research Questions and Objectives</i>	<i>17</i>
Table 2	<i>Examples of Problems Experienced by Education Institutions by Province in 2019 (DHET, 2019, p. 92).....</i>	<i>26</i>
Table 3	<i>Overview of common micronutrient deficiency impacts</i>	<i>35</i>
Table 4	<i>Summary and Analysis of Some Questions.....</i>	<i>64</i>
Table 5	<i>Spearman's rho assessment</i>	<i>66</i>
Table 6	<i>Chi-square test.....</i>	<i>67</i>
Table 7	<i>One-way ANOVA</i>	<i>68</i>
Table 8	<i>Type of ECD Centre by Province (ETDP-SETA, 2020, p. 33).....</i>	<i>75</i>
Table 9	<i>Initial product offering.....</i>	<i>75</i>
Table 10	<i>Overview of financial operational requirements</i>	<i>76</i>

List of Figures

Figure 1	<i>Cycle of Health and Poverty (Claeson et al., 2002, p. 203).</i>	12
Figure 2	<i>Vicious Cycle Between Poverty and Malnutrition (Vorster, 2010, p. 3)</i>	16
Figure 3	<i>UNICEF Conceptual Framework for the Causes of Malnutrition (Maxwell, 2014, p. 3)</i> ...	20
Figure 4	<i>The Vicious Cycle of Poverty and Malnutrition (Maxwell, 2014, p. 3)</i>	23
Figure 5	<i>Conceptual Framework: Stagnant Economic Growth and Poverty (Mbuli, 2008, p. 70)</i> ..	24
Figure 6	<i>Number and Percentages of Learners Achieving Matriculation with Bachelor's Pass and Mathematics Passes at Higher than 50% from 2010-2017. (DHET, 2019, p. 51)</i>	27
Figure 7	<i>Food Adequacy by Province 2018 and Vulnerability to Hunger and Access 2002-2018 (Stats SA, 2008, p. 18)</i>	29
Figure 8	<i>The Infection Malnutrition Cycle (Maxwell, 2014, p. 6)</i>	32
Figure 9	<i>Nutrition as an Influencing Factor on Brain Functioning and Cognitive Development (Brands, 2011, p.10)</i>	34
Figure 10	<i>Malnutrition Consequences Throughout an Individual's Life Span (Bailey et al., 2015, p.21)</i>	35
Figure 11	<i>Pathways Connecting State-Level Economic Growth and Child Undernutrition (Bailey et al., 2015, p.2)</i>	38
Figure 12	<i>The theoretical approach to the role of institutions (Acemoglu et al., 2014, p.876)</i>	41
Figure 13	<i>Development Entrepreneurship as Nexus of Social Entrepreneurship, Business Entrepreneurship, and Institutional Entrepreneurship (McMullen, 2011, p. 187)</i>	44
Figure 14	<i>Typology of Human Capital (Marvel, Davis & Sproul, 2016, p. 616).</i>	46
Figure 15	<i>Model of Human Capital and the Entrepreneurship Process. (Marvel, Davis & Sproul, 2016, p. 618)</i>	48
Figure 16	<i>Importance of Nutrition (Uauy, Kain, & Corvalan, 2011, p. 1760)</i>	51
Figure 17	<i>Map of Johannesburg showing the 7 regions of the city (www.pikitup.co.za)</i>	58

Figure 18	<i>Factors Affecting Households' Decisions Regarding Urban Agriculture</i> (Nugent, 2000)	69
Figure 19	<i>Images of vertical and bag planting on the balcony</i>	70
Figure 20	<i>Images from the SSVP Woza Sidle Project in Diepsloot</i>	71
Figure 21	<i>Development Entrepreneurship as Nexus of Social Entrepreneurship, Business Entrepreneurship, and Institutional Entrepreneurship</i> (McMullen, 2011, p. 187).....	72
Figure 22	<i>Human Capital Development Pathway</i> (Ilifa Labantwana & Kago Ya Bana, 2016, p. 1)...	73

Executive Summary

Malnutrition remains as one of the most serious health problems worldwide. Evidence indicates a link between poverty and malnutrition with complex and multiple connected elements that are both causes and consequences of malnutrition. Malnutrition causes poor cognitive development and reduced physical capacity affecting human capital development, which in turn reduces productivity, slows economic growth, and perpetuates poverty.

When developing strategies or mechanisms to sustainably reduce malnutrition the focus needs to be on addressing the root or basic causes as this drives the underlying and immediate causes ultimately manifesting as malnutrition. Studies recommend short- and long-term strategies to reducing malnutrition which need to be implemented simultaneously as the long-term aspects focus on increasing economic factors such as income and food security; the short-term aspects aim to provide health, education and nutrition which directly impact human capital development. Strengthening the commitment and increasing action to tackling malnutrition requires partnerships between different stakeholders namely, government, the private sector, and the development partner community.

Eradicating malnutrition is vital as it lays the foundation for human capital development and is known to undermine economic growth further impacting a wide range of social factors and human rights.

Investing in nutrition yields high returns of investment when implementing cost effective programs targeted towards pregnant women, infants, and young children as the phases between conception and first 1000 days of life present a window of opportunity to focus action on addressing malnutrition (The World Bank, 2006).

Overview

Nutritional status is a measure of good health. The World Health Organisation (WHO) noted that “health is not only the absence of disease but a state of complete mental and physical wellbeing in relation to the productivity and performance of an individual” (Tontisirin, 2004).

Nutritional status constitutes the foundation for human development and is essential for school performance and attainment by reducing susceptibility to infections and disease and improving learning capacity and cognitive performance. It is internationally recognised that nutritional status is an indicator of national development and nutrition is a precondition for economic and social development. Despite recognising the importance of nutrition, most developing countries are struggling to ensure that households have adequate and consistent access to good nutrition, resulting in malnutrition (Tontisirin, 2004).

Poor health and malnutrition are manifestations of institutional failures emanating from socio-economic, environmental, political, and intra-household factors (Tontisirin, 2004). Nearly 800 million people in the developing world are chronically undernourished and at least two billion people suffer from micronutrient deficiencies (WHO, 2018). Child malnutrition is pervasive and has short- and long-term consequences that significantly affect individuals and the societies in which they live (Martorell, 1999). Malnutrition is linked to half of all child deaths worldwide and affects one in five children in developing countries (Ijarotimi, 2013). It weakens the immune system affecting millions of the world’s populations and no country can afford to ignore the causes and consequences of it (WHO, 2018). Malnutrition occurs in both poor and non-poor households as individuals are not always aware of what food or feeding practices are best for their children or themselves and caregivers cannot easily tell when children are becoming or are malnourished as it is usually invisible to the untrained eye (The World Bank, 2006).

There are two main categories of malnutrition namely, undernutrition and overnutrition. Undernutrition reflects an absence of macro or micronutrients or both, which continue to be the dominant nutritional problem in most developing countries (WHO, 2016). Overnutrition results

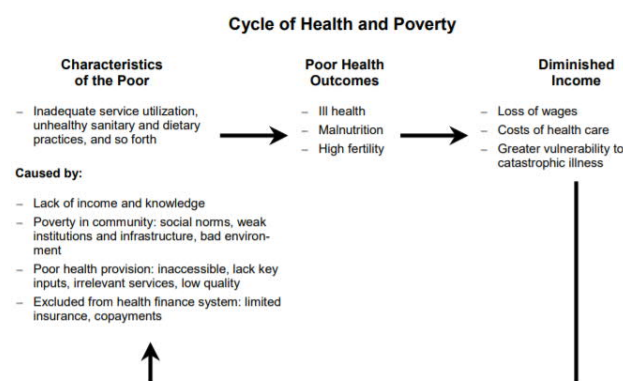
from the excessive intake of calories and is a growing concern in developing, middle-and upper-income countries (Hoddinott, Torero & Rosegrant, 2012). An individual can suffer from under and over nutrition at the same time which has been described as the “double burden” (Varela-Silva et al., 2012). Illness and/or insufficient food intake and poor diet are causes of deficiencies or excesses of energy and nutrients (WHO, 2016).

Malnutrition, usually caused by a lack of food, is closely associated with hunger as it mainly occurs when a person consumes an insufficient number of calories required to sustain their bodies. There are also other reasons such as illness or poor diet choice resulting from poor nutritional knowledge or awareness, that contribute to malnutrition as people who have plenty to eat may still be malnourished (EUFIC, 2006).

Poverty is a major determinate of hunger as those who live in poverty lack sufficient purchasing power to buy adequate nutritious food and are more likely to suffer from malnutrition (United Nations Secretariat, 2003). Malnutrition and poverty underpin each other creating a vicious cycle. Siddiqui et.al, explained that poverty compromises the quality of food intake thereby contributing to malnutrition and bolstering the deficiency of essential vitamins and minerals also known as hidden hunger causing illness and poor health also affecting performance and productivity levels over and above all other effects in other areas (Siddiqui , Salam, Lassi & Das, 2020, p. 2).

Figure 1

Cycle of Health and Poverty (Claeson et al., 2002, p. 203).



The cycle of poverty and health is difficult to break and affects millions around the world. The two elements are inextricably linked as poverty increases one's probability of becoming ill and poor health increases due to poverty. *Note.* This Image is Copied in Terms of Section 12 of the Current SA Copyright Act

Hunger is closely linked to food security, but they are not the same because “an absence of hunger does not imply food security” (Hoddinott, Rosegrant & Torero, 2012, p. 4). When households are experiencing financial challenges, to safeguard longer-term food security they may skip meals and buy cheap energy dense food that provides satiety but offer little to non-nutrients (Hoddinott, Rosegrant & Torero, 2012). Poverty and food insecurity are also closely related because during poverty, people might experience unreliable food supply created by unfavorable conditions (Siddiqui, Salam, Lassi & Das, 2020).

It is vital to highlight that nutritional status and poverty are closely intertwined and influence human capital development. Nutrition has a profound impact on human capital development as deficiencies in essential nutrients affect an individual's mental and physical growth and development (Siddiqui, Salam, Lassi & Das, 2020). Child malnutrition is of greater concern as survivors of early childhood malnutrition suffer functional disadvantages as adults (Martorell, 1999). The disadvantages of malnutrition during childhood include learning disabilities resulting in poor school performance, ill health affecting school attainment, poor class participation due to low concentration levels, delayed motor, cognitive, and behavioral development, and during adulthood include diminished intellectual performance and low work capacity or productivity (Martorell, 1999). A report by (Europarl.europa, 2014) indicates that the effects of malnutrition are devastating and largely irreversible, even leading to death.

Human capital is a valued asset and great source of intellectual power for any economy and the process of developing it is important. Human capital development begins from the utero stage and continues throughout an individual's life span and malnutrition undermines all investments made towards it (Siddiqui, Salam, Lassi & Das, 2020). Institutions also influence human capital

development through the provision of quality education, knowledge and skills development which is needed to create and innovate products, services, and technology (Fedderke, 2002). Human capital development is vital for economic performance and development which affects opportunities and the standard of living conditions of individuals.

By expanding the knowledge and skills of individuals the economy can develop due to innovation and increased productivity levels, increasing economic growth and employment opportunities. Human capital development, economic development and employment are intrinsically linked. The findings in research conducted by Christelle et al. (2010) suggest that the probability of remaining unemployed decreases with increased education and skills levels.

Unemployment serves as a direct catalyst to poverty and inequality and is recognized as one of the triple challenges that South Africa faces (Stats SA, 2017). Human capital is an integral determinant of economic structure and the best instrument to sustainably reduce unemployment positively impacting poverty and inequality (Samiullah, 2014). Addressing unemployment through human capital development has a direct impact on the reduction of poverty and inequality (Frye, 2006).

Historical literature from the World Bank and other development institutions indicate that malnutrition and hunger can be lessened through economic development and income growth. Public policies and institutions that foster sustainable economic growth and development accompanied by decreasing income inequality are needed. There are economic and social benefits for investing in nutrition as intellectual resources determine a nation's economic power (World Bank, 1981).

Reducing malnutrition is an issue of economics, welfare, social protection, and human rights (The World Bank, 2006).

Research problem

Poverty indicators include hunger and malnutrition, limited access to education and other basic services and it has been identified as both a cause and consequence of malnutrition (Vorster, 2010).

The impacts from malnutrition have a ripple effect on economies and health care systems, undermining investments in education and institutional changes (FAO, 2014). Poverty and malnutrition have a large impact on South Africa's population affecting health, physical, mental, and emotional development in the early stages of life, possibly posing serious implications for human capital development in general due to a lack of sufficient nutritious food (Vorster, 2010). Evidence from many studies have identified a link between nutritional status and health of children and education outcomes (Behrman, 1996), (Pollitt, 1990).

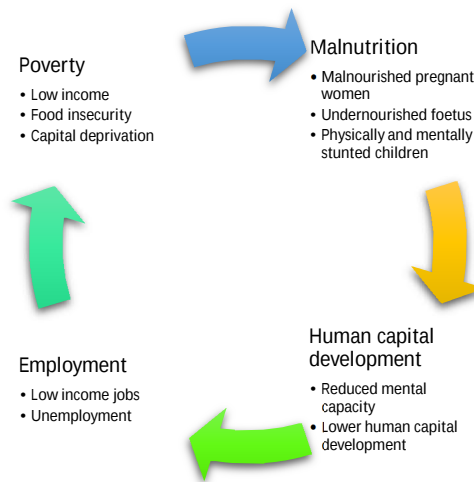
Malnutrition in the early stages of development produces a detrimental effect on the mental and physical development of children which negatively impacts their learning capacities and in turn is likely to affect school performance in late childhood (Premraj & V, 2017).

"Children are vulnerable to malnutrition from conception" (Premraj & V, 2017) and if they do not receive proper nutrition before the age of 24 months, they could suffer irreversible damage into their adult life and to subsequent generations (Premraj & V, 2017).

The challenge is complex and requires integrated interventions, there is agreement amongst researchers in the field of child development (Engle & Lhotska, 1999), (Grantham-McGregor, Fernald, & Sethuraman, 1999), (Nelson, 2000) (Wachs, 1999) that nutritional and other interventions that address poverty-related causes of malnutrition are instituted in the first 1000 days of life, will improve child development (Vorster, 2010). Data analyses presented from the developing world clearly indicates that only an improvement in human capital through interventions in health, nutrition and education will lead to increased productivity positively impacting income to lift individuals out of (Dao, 2008)

Figure 2

Vicious Cycle Between Poverty and Malnutrition (Vorster, 2010, p. 3)



This image expands on Figure 1 that showed the link between poverty and ill health. It indicates that reduced mental capacity and lower human capital development are linked to foetal and early infant and childhood malnutrition. “The reduced human capital is associated with an inability to grow optimally, develop and benefit from education, poor socialisation and generally a reduced capacity to lead productive lives” (Vorster, 2010, p. 4).

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Arguably the most vulnerable and important time in a human's life is during the early childhood phase as it is a stage of growth and development of both physically and mentally and possibly impacting a person's future well-being for the rest of their lives. The growth and development phase are a short and finite time and missing an opportunity to develop properly as a child may be difficult to overcome later in life (Valente, Andrews, Leigh, & Currie, 2001)

“A reduced cognitive capacity hinders the ability to learn, thus preventing individuals from reaching their full educational potential” (Morgan, 2015) and cognitive impairments are likely to impact school performance and attainment.

Nutrition and quality education affect human capital development with malnutrition disrupting all investments in human capital achievement, as the aim is to increase the knowledge

and skills of people to develop and grow the economy by driving innovation and productivity.

Investment in people's education and development results in a knowledgeable workforce that can increase quality and productivity directly impacting economic growth. "Investment in child nutrition contribute to a country's economic development" (Michaelson, Weaver, Branca, & Robertson, 2003).

The prevention and reduction of malnutrition during periods of vulnerability, namely during utero and during the first 1000 days of life as this is a critical phase for the growth and development of children to building the foundation for human capital development which is viewed as a key strategy for long-term economic development (Martorell, 1999). To this end, this research will attempt to identify mechanisms to sustainably reduce malnutrition within urban households.

Table 1

Overview of Research Questions and Objectives

No.	Research question	Research objective
1	What are the root causes of malnutrition?	To highlight the different factors that contribute to malnutrition
2	Can the vicious cycle of poverty and malnutrition be broken	To assess the link and reduce malnutrition
3	How do institutions contribute to malnutrition	To highlight the role and importance of institutions when identifying recommendations and strategies to reducing malnutrition
4	What are possible interventions to improve development competence?	To highlight the complexity and interdependence of requirements
5	Can nutritional and other interventions improve child development	To identify mechanisms to sustainably reduce malnutrition
6	Can a model be developed that simultaneously improves malnutrition, human capital development and the quality of institutions as all three aspects are closely interlinked?	To build a model using Development entrepreneurship to sustainably reduce malnutrition by focusing on the first 1000 days of life and closely interlinked factors.

Delimitations of the Study

- The term malnutrition generally refers both to undernutrition and overnutrition, but in the report the term refers to undernourishment with a focus on micronutrient deficiencies.
- The scope was cross sectional and included analysis of data collected from households in Johannesburg
- The analysis is based on 104 observations
- Identifying and resolving challenges and issues within the education system.

Definitions

- **Balanced Diet:** a diet that consists of a variety of different food types that provide the body with adequate amounts of nutrients necessary for the body to function properly (Krans, 2020).
- **Employment:** an agreement between two parties where one will provide services in return for payment by the other, the employer is in control of the activities that the employee engages in (Heathfield, 2020) .
- **Food security:** “Food security [is] a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (IWMI, n.d.).
- **Hunger:** “a condition, in which people lack the basic food intake to provide them with the energy and nutrients for fully productive, active lives” (IWMI, n.d.) .
- **Nutrition:** is the process of nourishing the body through food and how it uses it for growth, metabolism, and repair it also includes different stages that include ingestion, digestion, and absorption (Davies, 2021).

Section 1: Determinations and Consequences of Malnutrition

Determinates of Malnutrition

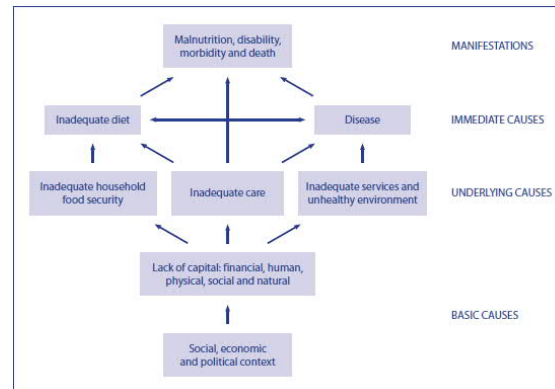
The determinates of malnutrition are broad, covering aspects such as biological, social, cultural, economic and morbidity factors. Prime determinates of child and maternal nutritional status is the economic status of a household as it affects access to adequate food supplies, child caring practices, use of health services, availability of improved water sources, and sanitation facilities (Grima & Genebo, 2002) .

According to Austin (1978) the roots of malnutrition are found in economics, education, agriculture, and health, meaning that this multiple etiology requires approaches to the problem that engage numerous and different institutions (Austin, 1978). The root cause of malnutrition experienced by young children is multifaceted with several basic and underlying factors related to poverty (food insecurity, poor diets, illness, and inadequate sanitation) (Psaki et al., 2012).

UNICEF developed a model conceptualising and explaining the root causes of malnutrition grouped into different levels namely, basic, underlying, and immediate (Munthali, 2017). They noted that “all causes of malnutrition act on the individual, but some causes act directly and others indirectly through a longer causal pathway which is captured in the model in fig 2” (Maxwell, 2014, p. 2).

Figure 3

UNICEF Conceptual Framework for the Causes of Malnutrition (Maxwell, 2014, p. 3)



The model highlights the complexity of multiple connected elements which are beyond food and health care. Basic causes affect an entire society, underlying causes affect households and communities while immediate causes affect the individual. *Note.* This Image is Copied in Terms of Section 12 of the Current SA Copyright Act

Basic causes are related to the social, economic, and political environment which control the different elements of capital and contribute to the underlying causes that influence the economic status of households and immediate causes leading to illness and inadequate diets at the individual level.

Basic Causes: Institutions and Malnutrition

Basic causes of malnutrition are attributed to political, legal, social, religious systems and cultural factors also known as institutions that govern society. These institutions regulate the quality and quantity of capital: financial, human, physical, social, and natural elements that impact social and economic development thereby creating opportunities or constraints on the actions of households and individuals (Hoddinott, Torero, & Rosegrant, 2012).

Acemoglu, Gallego & Robinson (2005) noted that institutions consist of three interrelated concepts (Docquier, 2014):

- Economic institutions: factors that govern the incentive structures and the distribution of resources e.g. the structure of property rights and redistributive tax-transfers.
- Political power: the distribution of resources determines political power which in turn determine the quality and design of economic institutions.
- Political institutions: include the allocation of jure political power and is linked to government characteristics and design of the constitution.

Institutions are established to govern human behaviour and affect economic performance, providing structure and order for economic exchanges to take place (North, 1990). Angeles elaborated further that “Institutions establish the constraints, determine the costs and benefits, under which individuals take economic decisions” (Angeles, 2011). They impact the allocation of scarce resources through their laws, policies, and economic systems which influence economic agents and interests.

Institutions are instrumental in capital development with human capital being the foundation and a prerequisite for economic growth and development. “Institutions are products of the past process, are adapted to past circumstances, and are therefore never in full accord with the requirements of the present” (Bush & Tool, 2003).

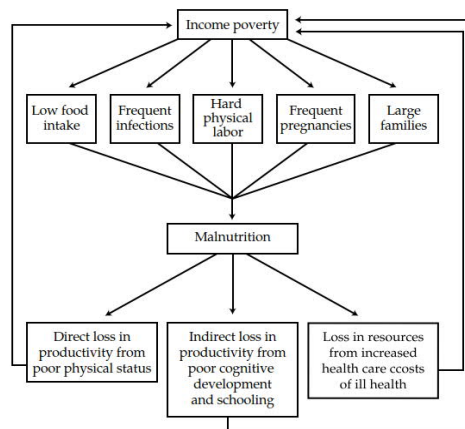
Byrnes (1996) observed that over several centuries the economy of South Africa has been shaped by its abundant natural resources and the efforts of immigrant populations to control and exploit the country through colonization and segregation (Byrnes, 1996). The economies of countries that have undergone colonial domination and in the case of South Africa, both colonisation and apartheid, are plagued by extractive institutions (Ferrini, 2012).

From 1948 to 1994, South Africa was politically, socially, and economically dominated by the white minority population. The legislation sanctioned the “reservation” of specialised jobs and managerial positions for the minority, legally excluding any qualified black person (Byrnes, 1996). The education system for black people referred to as Bantu education legally restricted educational services and denying access to quality education, the curriculum was created to teach and train

students for unskilled job opportunities thus earning low wages causing inequality and poverty. The lack of quality education is the reason why many South Africans are economically poor and why the country is experiencing high unemployment and poverty levels. Education relates directly to human capital development providing access to employment and socioeconomic opportunities (Gallo, 2020).

Figure 4

The Vicious Cycle of Poverty and Malnutrition (World Bank, 2006, p. 23)



This figure indicates how malnutrition hinders both the physical capacity of performance and earnings; weak physical status combined with poor cognitive development and low school performance and high health care costs affect income levels which in turn impacts malnutrition.

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South Africa's economy experienced "growth-enhancing structural transformation until the early 1970's" this growth was driven by industrialization that "disproportionality benefited high skilled, white workers" (Bhorat, Lilenstein, Oosthuizen & Thornton, 2020). By the late 1980's almost every facet of the economy was controlled by government as the state owned and managed a significant portion of the country's wealth-producing assets, including energy and oil producing resources and industries that were vital to the services sector (Byrnes, 1996).

The apartheid regime distorted the economy by enforcing policies that excluded many from equal economic participation, many households' basic needs were unmet, leading to far-reaching impacts like hunger, malnutrition and undereducation (Byrnes, 1996). Due to the inferior education provided to majority of the population, skills and resources needed for the country's infrastructure and labour market were not available and weaknesses in the economy became increasingly evident by the early 1990's. By the time change was implemented, the severe and long-lasting economic

problems caused by the regime, were deeply entrenched. The new government faced enormous challenges trying to correct policies created by the previous government whilst growing the economy.

Despite significant changes since 1994, the transition between the old and new political regime and government has been difficult, with the institutional environment attributing to “failures of governance including labour market rigidities, education system weaknesses, fiscal system inefficiencies, legal system and corporate governance defect, and substantial corruption” (Dutraive, 2009, p. 9). The economy has since been characterised by positive but low levels of economic growth, combined with high levels of unemployment and rising income inequality.

Figure 5

Conceptual Framework: Stagnant Economic Growth and Poverty (Mbuli, 2008, p. 70)

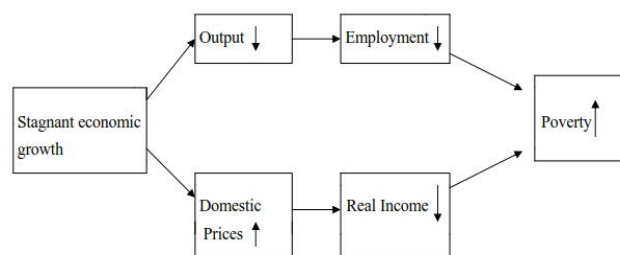


Figure 5 represents the overall effect that a stagnant economy can have on poverty. The general assumption is that a decrease in economic growth affects poverty through two main channels namely:

- output reduction negatively influences employment levels thus increasing the poverty rate
- domestic price increases affect real income levels further contributing to an increase in poverty

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Many developing countries are left in a so-called permanent state of economic recession due to poor education practices and policies (MyBroadBand, 2015). Discriminatory and flawed education and employment policies from the past are reflected in the severe skills mismatch in the

labour markets between supply and demand. The inability to participate in the labour market or economic opportunities due to exclusion from quality education and skills can be blamed for unemployment, poverty, and inequality.

“The labour market is at the heart of inequality, and central to labour market inequality is the quality of education. To reduce income inequality substantially requires a different wage pattern based on better human capital for the bulk of the population” (Keeton, 2014, p. 31). The state of the education system has a direct impact on the outcome and availability of skilled labour. Providing individuals with the necessary skills and knowledge requires a properly functioning education system. Fixing the education system is necessary to reduce unemployment and inequality in South Africa (Keeton, 2014).

An OECD report stated that education is a powerful predictor of the wealth that countries will produce in the long run. A country's economic output has a direct correlation with quality education and skill development. The ability of nations to drive and enable human capital accumulation relies on a combination of motivation and capabilities to change existing institutions (Mpendulo & Mang'unyi, 2018). Poor governance, high levels of public debt, corruption and lack organisational and managerial skills are some of the obstacles to providing quality education. The poor quality of teaching affects children throughout their education and work life as many lack basic skills in reading, writing and arithmetic, inadequate infrastructure with poorly equipped schools resulting in overcrowded classes combined with poorly trained and ill- prepared teachers.

Table 2

Examples of Problems Experienced by Education Institutions by Province in 2019 (Department of Higher Education and Training, 2019, p. 92)

Kind of problem experienced	Thousands									
	Western Cape	Eastern Cape	Northern Cape	Free State	KwaZulu-Natal	North West	Gauteng	Mpumalanga	Limpopo	South Africa
Lack of books	20	145	14	69	152	54	78	103	69	703
Poor quality of teaching	15	24	4	12	41	6	55	17	9	183
Lack of teachers	16	104	7	9	37	21	36	14	8	253
Facilities in bad condition	30	43	8	52	109	46	52	38	2	381
Fees too high	60	49	9	19	87	41	182	36	*	482
Classes too large/too many learners	94	112	10	18	136	63	140	34	19	626
Teachers are often absent from school	10	18	4	8	23	12	42	5	2	124
Teachers were involved in a strike	*	5	*	3	13	*	11	8	*	43
Total	246	500	56	190	599	243	596	255	110	2 795

Due to rounding numbers do not necessarily add up to totals.
Values based on three or less unweighted cases are considered too small to provide accurate estimates, and values are therefore replaced by asterisks.

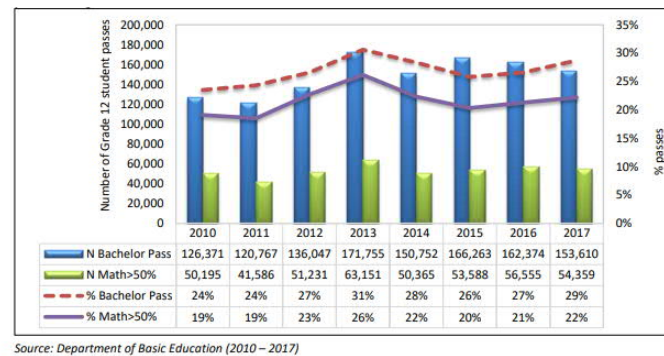
Table 2 indicates the challenges experienced by learners at public schools with lack of books, classes with too many learners and high fees being singled out as the most important problems. Problems relating to teachers are 4th on the list all of which results in poor quality education impacting skills and knowledge development.

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Cognitive skills are closely related to differences in economic growth across countries and have been described as core skills that the brain uses to think, read, learn, remember, reason, and pay attention which are assessed against international standards in mathematics and science (Hanushek, 2013). In an assessment conducted by OECD in 2015 South Africa ranked second to last in the world in maths and science based on the test scores from 76 countries (MyBroadBand, 2015). In comparison with other countries, it was noted that our teachers don't have the necessary skills to teach maths and science.

Figure 6

Number and Percentages of Learners Achieving Matriculation with Bachelor's Pass and Mathematics Passes at Higher than 50% from 2010-2017 (DHET, 2019, p. 51)



Source: Department of Basic Education (2010 – 2017)

High pass rates in mathematics and science remain elusive. Figure 6 indicates the possible pool available to enter higher education and training institutions. 29% of learners achieved matriculation with a bachelors pass in 2017 while the number of learners who passed mathematics with more than 50% stood at 22% in 2017. The low-quality performance results in low numbers of a potential pool of school leavers who are eligible to enter the Science, Engineering, and Technology field.

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Underlying Causes: Household Determinants of Malnutrition

“The outcome of institutions have effects which lie deep in the socio-economic fabric of societies” (Ferrini, 2012).

Poverty manifests in different forms of deprivation and is the main factor that affects all underlying determinants of malnutrition. Economics and education are forms of biological deprivation with malnutrition being an objective quantitative measure of poverty. Economic deprivation pertains to the lack of economic resources to trade/exchange for the consumption of economic goods and services (Govender et al., 2007).

The UNICEF model identifies the underlying causes of malnutrition as inadequate household food security, inadequate care and inadequate health services and unhealthy household

environments, all elements of poverty. Poor households and individuals struggle to achieve and maintain food security, to accumulate and create additional resources and have access to adequate resources for care.

Food security consists of three main components namely, availability, access, and utilisation.

Availability is defined as “sufficient quantities of food of appropriate quality supplied through domestic production or imports (including food aid)” (FAO. & ESA., 2006).

It refers to the physical production and distribution of safe and nutritious food at a given time and place. A country’s food system should provide an adequate supply of food that can be accessed on a timely and reliable basis to all households (Erokhin, 2017). Availability is not only about quantity (supply and trade) but also quality and diversity of food. It is important to note that an adequate supply of food at a regional, national, or international level does not guarantee household level food security. In a study conducted by Erokhin (2017), on food security issues in Sub Saharan Africa it was concluded that many individuals were malnourished due to the lack of resources to gain access to food and not because of low availability in the market (Erokhin, 2017).

South Africa is regarded as being food secure on a national level, though there are numerous indications that many households and individuals encounter food and nutrition insecurity (Vorster, 2010). De Zeeuw & Prain highlighted that it’s not an issue of food availability as such but rather low household income levels that limit access to food and is the main cause of food insecurity (de Zeeuw & Prain, 2011).

Access is defined as the ability to acquire sufficient quantities and quality of food to meet all members of the household’s nutritional requirements for a productive life (Leroy, Ruel, Frongillo, Harris & Ballard, 2015).

Figure 7

Vulnerability to Hunger and Access 2002-2019 and Food Adequacy by Province 2019 (Stats SA, 2019, p. 60 and 61)

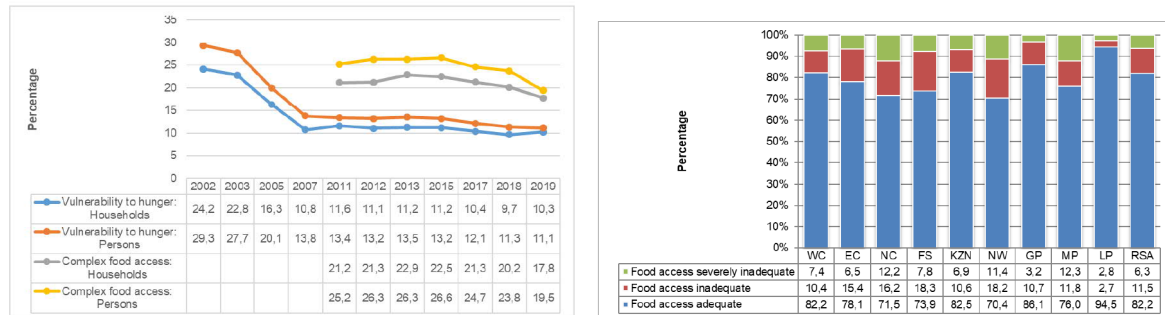


Figure 7a, indicates that 10.3% of households were vulnerable to hunger in 2019 and 11.1% of persons experienced hunger, with both indicators showing a decrease from 2002. Figure 7b, indicates that 11.5% of households have inadequate access to food while 6.3% experienced severely inadequate food access.

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There are three aspects to access namely physical, economic, and social.

- Physical access is influenced by peripheral location and logistical infrastructure it includes the range of food in supermarkets, retail stores and other venues where people purchase goods.
- Economic access usually includes money received from employment (paid or self-employment), transfers received other than social, social transfers in kind and through government interventions.

Income deprivation due to unemployment, low wages can lead to household food insecurity, inadequate care and health services and unhealthy household environments. Purchasing power serves as a main determinate of the ability to afford nutritional food sources hence people with low socioeconomic status are vulnerable to food insecurity.

The ratio between income and expenses are important as a lack of discretionary income affects food choices and ultimately nutritional status. Household expenses include accommodation, utilities, transportation, education, food, and other costs. Food expenditure is one of the expenses that are within a households' control after paying debt and non-negotiable payments. They can modify their food purchases to survive, by cutting back on food (PACSA , 2014). Individuals modify their diets according to their socio-economic status and nutrition awareness levels (FAO., 2020). The typical survival strategies that are adopted by households include buying smaller quantities, switching to cheaper brands and different food types, buying energy dense food, reducing dietary diversity, and skipping meals.

Overall income levels influence household decisions in food consumption, health, and childcare. Educational levels of parents or caregivers influence income earning abilities and the availability of information regarding nutrition, child feeding and caring practices. Dynamics of earning income and purchasing power are important components of access (Erokhin, 2017).

Salaries is the main source of income for many households with income reflecting individuals' opportunities and access to resources. The conditions of the past have impacted income generation for many households with the current high unemployment rates posing further severe constraints to their livelihood. Low income or no income narrows food selection choices as most households will opt for low cost, high energy foods which are more filling instead of nutrient dense foods which tend to be more costly and are not as filling, increasing the risk for micronutrient deficiency.

- Social access is influenced by cultural and religious beliefs, experiences from upbringing and interactions with social groups, all these factors influence dietary intake. Families and friends also play a significant role in food choices. Tradition and cultural beliefs also affect intra-household food allocation. According to Brands (2011), caregivers influence

to some degree a large aspect of a child's life, these aspects include their knowledge and “development of food choices by controlling the availability and types of food in the home” (Brands, 2011). She further explained that the family environment is crucial as it lays the foundation for young children to learn and develop their eating habits and food preferences as they adopt their families eating behaviors as they ultimately influence and control their diets. Caregivers' lack of nutritional knowledge and their cultural beliefs may limit them from making the best use of available resources regarding optimal feeding practices. Studies have revealed that poor feeding practices contribute to the high prevalence of child malnutrition.

Utilisation is commonly understood as the way the body absorbs various nutrients in food, this dimension is determined primarily by an individual's health status. It refers to safe and nutritious food that meets the individual's dietary needs and includes a range of aspects such as safe drinking water, adequate sanitary environments and awareness of food preparation and storage procedures (Napoli, 2011).

Infection or disease also influence the body's ability to absorb or utilize the various nutrients found in food. It is important that caregivers have adequate knowledge and understanding of what foods to choose and how to prepare and store it. There is an important connection between nutritional knowledge and dietary intake as “nutritional knowledge may not convert through to action, skill or process knowledge, which is basically the ability to choose healthier foods, from a range of available options and understand food labels” (Spronk, Kullen, Burdon & O'Connor, 2014).

Inadequate Care, Health Services and Unhealthy Household Environments. These factors are directly influenced by economic access and are linked to poverty. Institutions at a national and local level are responsible for providing communities with clean water, adequate sanitation, and healthcare facilities.

Rapid urbanisation and unplanned transitions affect the planning and meeting of infrastructure, facilities, and service's needs. Inadequate capabilities to cope with the housing needs

of people has resulted in the evolution of unplanned settlements. People have succumbed to building illegal structures that do not conform to planning and building regulations. The structures are low-cost and built with non-permamanet materials and the settlements have a high population density in comparision to other formal housing areas.

Urbanisation can be seen as the “promotion of inequalities through the expansion of deprived settlements and the inability of municipal authorities to respond to the growing demands of an increasing population for basic social and environmental amenities” (Konteh, 2009)

Immediate Causes at an Individual Level. Immediate causes are due to an imbalance between what the body requires, and the number of nutrients absorbed due to inadequate food intake or disease (Black et al., 2008). Nutrients need to be consumed appropriately and with the right blend for adequate absorption with dietary intake focusing on quantity and quality.

Inadequate diet and disease impact each other which is referred to as the infection-malnutrition cycle and in practice often occur at the same time.

Figure 8

The Infection Malnutrition Cycle (Maxwell, 2014 p. 6)

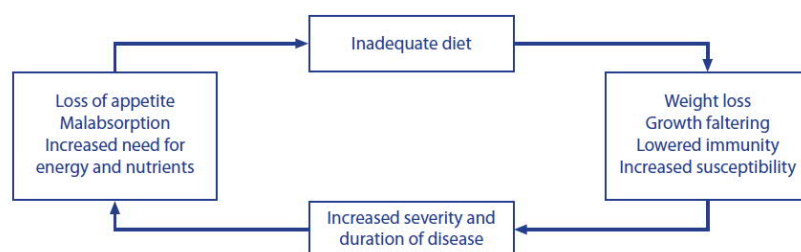


Figure 8 illustrates the infection-malnutrition cycle which in practice often occurs at the same time, as one can lead to the other.

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Consequence of Malnutrition

In general, the interrelationship between the causes and consequences of malnutrition is complex (Kimani-Murage, Kah, Pettifor & Al, 2010). Recent human studies have demonstrated that the “timing, chronicity, and severity of nutritional deficiencies has differential effects on brain development and on subsequent cognitive and emotional processes” (Lampl, 2018). During the first 1,000 days, brain development is rapid and continues throughout childhood, with nutrition playing an important role. Some studies indicate that the worst damages of malnutrition happen during pregnancy and early childhood. Poor nutrition affects economic productivity in the short-term (affecting undernourished adults’ activity and attainment levels) and long-term (through poorer cognition development and school performance).

Inadequate nutrition shortens attention span, reduces perception, causes difficulty in learning, induces behavioural disorders and absenteeism while reducing overall scholastic success (Kristo, Gultekin, Oztag & Sikalidis, 2020). During critical periods of development nutritional deficiencies could have a lasting impact on intellectual development.

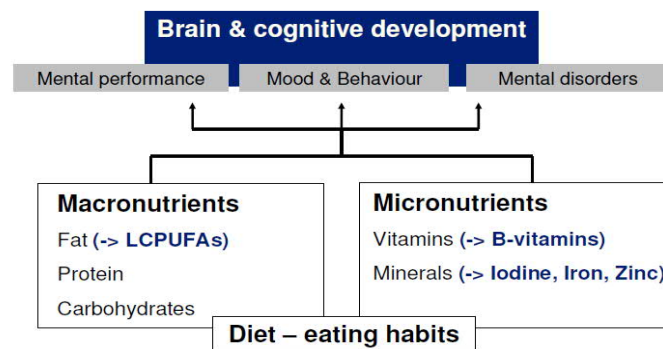
Multiple challenges of malnutrition were identified by (FAO., 2020) acknowledging that malnutrition in all its forms:

- affects the health and wellbeing of individuals by impacting negatively on physical growth and mental development
- it increases susceptibility to both communicable and non-communicable diseases by compromising the immune system
- poses a high burden in the form of negative social and economic consequences to individuals and households.

Repercussions of malnutrition are experienced both on an individual and national level impacting the economic prosperity of the country (Kristo, Gultekin, Oztag & Sikalidis, 2020).

Figure 9

Nutrition as an Influencing Factor on Brain Functioning and Cognitive Development (Brands, 2011, p. 10)



Diets consists of two major nutrient groups of macronutrients and micronutrients as indicated in Figure 9. Both groups can affect brain and cognitive development which is reflected by outcomes such as mental performance.

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Micronutrient deficiencies are an important component of undernutrition (hidden hunger). At least five micronutrients namely-Iodine, Iron, Zinc, Vitamin A and Vitamin B-12 have been linked to cognitive development and processes in infants and young children (Black, 2003).

Table 3

Overview of Common Micronutrient Deficiency Impacts

<u>Micronutrient</u>	<u>Deficiency impact</u>
Iodine	Critical for growth and cognitive development, adversely affects the central nervous system
Iron	Critical for motor and cognitive development
Zinc	Promotes immune function and assists in resisting infectious diseases including diarrhoea, it also affects physical growth
Vitamin B12	Needed for red blood cell formation and proper nervous system and brain function
Vitamin A	Supports healthy eyesight and immune system function, associated with increased risk of infant and child mortality
Folate	Supports healthy development of the brain and spine and is essential in the earliest days of foetal growth
Vitamin D	Builds strong bones by helping the body absorb calcium

(UNSCN, 2010)

Table 3 highlights some micronutrient deficiency impacts of which some are irreversible and have lifelong consequences with the severity, timing, and extent dependant on existing underlying conditions.

Figure 10

Malnutrition Consequences Throughout an Individual's Life Span (Bailey, West Jr, & Black, 2015, p. 21)

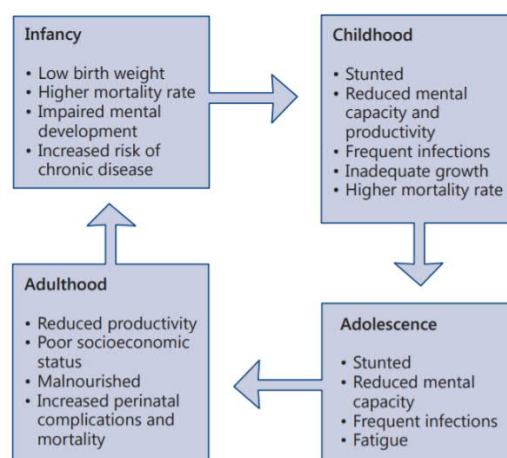


Figure 10 illustrates the intergenerational cycle effects as a consequence of micronutrient deficiencies which spans throughout an individual's life.

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Conclusion

The quality and type of institutions are vital as they regulate the quality and quantity of capital that impact social and economic development influencing income opportunities or constraints for households and individuals.

Poverty, inequality, and unemployment in South Africa are related and undoubtedly products of the country's apartheid legacy. Most of the supply and demand challenges faced in the labour market can be linked to past policies of exclusion, resulting in poor knowledge, skills and low labour quality contributing to weaknesses that are evident in the economy.

The most significant risk factors that contribute to childhood malnutrition are poverty, poor education, low-income levels, poor child feeding practices, unhealthy household environments and poor health care facilities (Ijarotimi, 2013). It is recommended that in order for children to obtain the best possible cognitive growth and development they should have regular intake of a diversified diet that contains adequate nutritional content (Brands, 2011).

To prevent and reduce malnutrition in children three basic conditions need to be met: adequate food availability and consumption, adequate feeding practices and access to good health and medical care which is impacted by basic conditions controlled by institutions.

Action plans and policies that promote supply, access, consumption, and utilisation of a variety of foods adequate in quantity and quality should be developed and implemented.

There is a need for multiple and interconnected actors to embark on programs to sustainably eradicate poverty in households which would positively impact the nutritional and health wellbeing of children.

Section 2: Mechanisms to Sustainably Reduce Malnutrition

Introduction

South Africa's socioeconomic situation is largely described as characterised by the “triple challenge of inequality, poverty and unemployment”, which are interdependent socio-economic phenomena (DHET, 2019, p. 2). Reducing inequalities in individuals' assets requires investing in quality education and skills development as an effective strategy in decreasing poverty which would lead to efficient and sustainable economic growth (Pena & Bacallao, 2002). Macro- economic growth has often been identified as the only sustainable instrument to improving nutrition and health in developing countries (Preston, 1975); (Prichett & Summers, 1997), (Smith & Haddad, 2002). The principle being that economic growth improves income especially among the poor increasing their “access to and consumption of health-promoting goods and services, leading to improved nutritional status” (Subramanyam, Kawachi, Berkman, & Subramanian, 2011). Three non-exclusive pathways through which economic growth could improve children nutritional status have been identified namely:

1. an increase in income for all (this is must be emphasized as it is vital)
2. reduction in poverty
3. investment in public programs that directly or indirectly could improve nutritional status among children

There is an expectation that the effect of income on nutrition yields proportionally higher nutritional dividends when increasing incomes among the poor instead of income increases for the higher end of the distribution. Though it relies on behavioural change at either the individual or household level because of improved economic standard of living (Subramanyam, Kawachi, Berkman, & Subramanian, 2011).

Figure 11

Pathways Connecting State-Level Economic Growth and Child Undernutrition (Subramanyam, Kawachi, Berkman & Subramanian, 2011, p. 2)

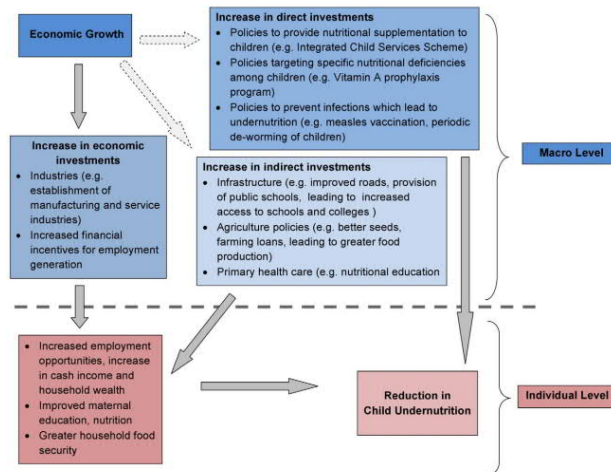


Figure 11 illustrates the argument that economic growth is a major policy instrument to improving health and nutrition in developing countries.

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Economic growth has been identified as a minimum requirement to address challenges of poverty and inequality, though alone it will not bring about a wider and equal spread of benefits to all social groups because it can easily bypass the poor, low-skilled and other marginalised groups. It does not always lead to the reduction of poverty and malnutrition because the benefits of growth are not shared and experienced by all. Economic growth in countries experiencing high levels of inequality often results in increasing the gap instead of reducing it because individuals in high earning jobs with higher levels of education and skill benefit from the increases leaving everybody else behind.

To ensure that the benefits of economic growth are equitably distributed amongst the different groups of society economic development is required as it brings about structural change and improves non-income components of society such as education and health. Economic

development focuses on improving the standards of living by addressing wider aspects such as life expectancy, levels of literacy, education, and health care. Economic development has been explained as “qualitative improvement in the structure, design and composition of physical stocks and flows resulting from an increase in knowledge, both of technique and of purpose” (Daly, 1987). Economic development usually refers to structural transformation and hinges on education levels of workers so that they may fully participate in the economy it depends on the co-operation between government and business, quality education, and social and cultural behaviour patterns (Feldman, Hadjimichael, Kemeny & Lanahan, 2014).

A knowledge-based economy needs time to develop and make investments in education, and training with the private sector leveraging off the new capabilities to create economic development ultimately enhancing the standard of living for its individuals, communities, and society.

Economic development is a complex phenomenon that depends on numerous factors and conditions that include:

- Innovation and technology.
- Initial conditions.
- Investment in physical and human capital.
- Institutional environment: strong macroeconomic policies and political stability, countries institutional and regulatory environment impacts investment and business creation (Fatas & Mihov, 2009).

One step further from economic development is inclusive economics “.....inclusive economics is a way of empowerment of the whole of humanity, to participate in a robust and all-inclusive economic process (including quality education and healthcare)” (Vasudev, 2013). The (United Nations Economic Commission for Africa, 2018), referred to it as growth that benefits everyone in the economy or reduces inequality or both. It refers to development that is distributed fairly across society creating opportunities for all, that is why inclusive economic development is vital

in any attempt to reduction and address the problems of poverty and malnutrition (Siddiqui, Salam, Lassi & Das, 2020, p. 2).

- The Invalid source specified. have summed inclusive development up using the three “Ps; namely, participation, place-based and partnership with participation being at the centre. Participation means enhancing skills and capabilities to generate an income and holding government accountable for quality public services
- Place-based refers to tailored made local policies and strategies aligned to local circumstances and realities.
- Partnerships between government, business, labour, and civil society understanding the interrelationship and working together to resolve problems.

Inclusive development can reduce unemployment which serves as a direct catalyst to poverty and inequality. The pathology of unemployment is complex, having both social and economic ramifications (Routh, 1986). Unemployment is pervasive in both developed and developing countries though the problem brings more challenges such as inequality and poverty and difficulties related to political and social instability for developing countries (Bangane, 1999).

There are three types of unemployment namely, structural (the main challenge for South Africa), frictional, and cyclical. The extent of structural unemployment depends upon the amount and type of changes in labour demand and supply including the speed of reducing the gap between mismatches. Actions identified to shorten the impact of structural unemployment usually include skills development and training and retraining of unemployed individuals so that their skills could match the existing demand. Low levels of structural unemployment are linked to higher levels of education, reasons cited are that highly educated people in comparison to individuals with low levels of education usually have a variety of job options and are more easily retrainable when there are changes in labour demand requirements. Structural unemployment is exacerbated by technical innovations as meeting the skill demand created by technological changes requires on the job training or specialist skills (Bangane, 1999).

Many believe that enhancing human capital development by improving education and providing training, skills development can reduce structural unemployment. Investment in education (human capital) is at the core of economics in the modern growth theory (Frederke, Luiz & de Kadt, 1998) and is viewed as a powerful and sustainable instrument for eradicating poverty and inequality as it improves the productivity and earnings of the poor (Rogers, 1995). Education more specifically quality education combined with school performance and attainment are important determinates of income allocation and long-term economic performance.

The cognitive skills of the population are closely related to long run growth improvement, issues such as school quality, enhancing both basic and advanced skills, and the development of cognitive skills needs to be in focus (Hanushek, 2013). Attention needs to be on educational achievement or cognitive skills instead of mere school attainment.

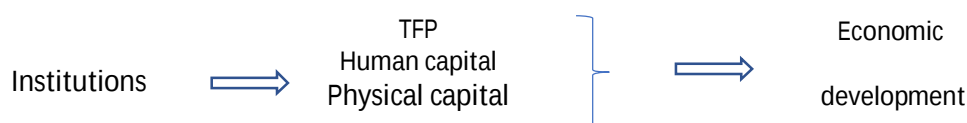
The growth of human capital is viewed to be both a condition and a consequence of economic development. Institutions determine the quality of education and influence human capital development making institutional change essential. Institutional change tends to be a slow process but is necessary to decisively break from the past and is a driver for change. a distinction was made between “proximate” (factors like capital accumulation, technological progress, labour) and “fundamental” (government efficiency, institutions, and cultural, political, and social systems) determinants of economic development (Acemoglu, Gallego & Robinson, 2014).

Figure 12

The theoretical approach to the role of institutions (Acemoglu, Gallego, & Robinson, 2014, p. 876)

fundamental determinants $\Rightarrow$ proximate determinants $\Rightarrow$ economic development

They argued for following causal chain:



The illustration summarizes the framework for potential change based on the theoretical approach proposed by (North & Thomas, 1973), it follows the argument of the causal chain.

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Institutional quality leads the virtuous cycle as it transmits into economic growth by shaping and enabling the “environment for individuals and firms to innovate and grow” (Bruinshoofd, 2016). There is consensus that institutions and long-term economic progress are closely linked.

A question raised was that with knowledge being central to increasing returns to scale in production: why are all countries not investing in knowledge production and freely adopting and copying to spread knowledge to increase their productivity levels? The answer lies with how societies and institutions are organised.

Quality institutions provide security to individual entrepreneurs and inventors by protecting their physical and intellectual property allowing for investment in new technology, products and /or innovations. Institutions influence the adoption of technology diffusion within a country impacting economic progress. Entrepreneurship is the source for creative destruction which brings about technological change and economic prosperity as disruptive innovations change the way we do things. Economic growth driven by creative destruction leads to the massive destruction of low-skilled jobs, creating opposition from individuals who anticipate losses to their economic privileges (economic losers) and political losers who fear that their political power will be eroded.

The process of overcoming resistance to change needs to include considerations that compensate economic losers during their transition to new jobs by providing them with income support. Sustainable transition through human capital development (nutrition, quality education, and skill development) is key to providing a solid foundation for change.

Institutions and Human Capital

Human intellect is a nation's greatest asset and determines its success and the existence of enabling institutions determine the nation's ability to develop human capital accumulation (Goldin,

2014). The education system of a country should be responsive to the needs of the economy and “it should provide the economy not only with enough educated people, but also with people who have the appropriate qualifications and skills” (Bangane, 1999, p. 71).

Human capital as a concept goes back to literature written by Adam Smith stating that: “The acquisition of talents during education, study, or apprenticeship, costs a real expense, which is capital in [a] person. Those talents [are] part of his fortune [and] likewise that of society” (Garza-Rodriguez, Almeida-Velasco, Gonzalez-Morales & Leal-Ornela, 2020).

human capital deals with “acquired capabilities which are developed through formal and informal education at school, at home, through training, experience, and mobility in the labour market” (Mincer, 1981). Sources of human capital include innate abilities that are likely to be heterogeneity, schooling, school quality and non-schooling investments, training, and pre-labour market influences “sociological”.

Institutional change is required to improve the entire process of acquiring and building capabilities and competencies that can be usefully applied for economic purposes including investments in the different sources of human capital such as schooling quality and non-schooling factors such as health and nutrition. To enable a new organisational change for human capital development and its interdependent components we need to understand that there are interrelationships between government policy, inducements for private entrepreneurs, and innovations by social entrepreneurs’ (McCarthy, 2010).

A structural overlap between participating organisations has blurred the lines bringing about new participants and ways to addressing challenges namely Development Entrepreneurship (DE) which is at the nexus of social, business, and institutional entrepreneurship. DE is viewed as a theory and solution that blends business, social and institutional entrepreneurship with the aim of “accelerating the institutional change needed for inclusive economic growth” (McMullen, 2011).

Figure 13

Development Entrepreneurship as Nexus of Social Entrepreneurship, Business Entrepreneurship, and Institutional Entrepreneurship (McMullen, 2011, p. 187)

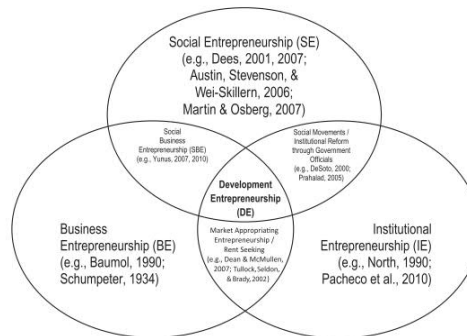


Figure 13 illustrates an “economic theory of social entrepreneurship that focuses on entrepreneurial activity occurring at the nexus of the three scholarly domains- seeking to directly change the formal institutions of economic growth by engaging in institutional entrepreneurship” (McMullen J. , 2011, p. 187).

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Institutional Entrepreneurship.

Institutional entrepreneurship (IE) aims to not only generate economic value but also to change established institutions and create new organisational forms (Tracey, Phillips & Jarvis, 2011).

It has been observed that it is the result of the “paradoxical” integration of two concepts:

- institutions which provide continuity and stability of organisational processes and constrain actors’ behaviour and
- entrepreneurship which is a creative force shaping and transforming institutions as the concept refers to “organised actors leverage resources to create new institutions or transform existing ones”.

The first aspect to addressing change:

“Without improving school quality developing countries will find it difficult to improve their long run economic performance” (Hanushek, 2013). Quality education is the fourth goal of the 17 Sustainable Development Goals (SDG) ratified by the United Nations. The goal is to ensure inclusive and equitable quality education, promoting lifelong learning. The view shared from the SGD is that “education is not simply a content delivery system; rather a system to help all children reach their full potential and enter society as productive citizens”. Quality education has been defined by the ASCD as “one that focuses on the whole child- the social, emotional, mental, physical, and cognitive development regardless of race, gender, ethnicity, status or location (Slade, 2017).

Hanushek argues that “cognitive skills of the population – rather than mere school attainment are powerfully related to individual earnings, to the distribution of income, and most importantly to economic growth” (Hanushek, 2013, p. 204).

It should be noted that there is a distinction between investment in human capital and human capital outcomes. Investments are important but fully realizing knowledge and or skills is even more important. Past research has provided evidence that outcome-based human capital constructs (i.e., knowledge, skills, and abilities) are direct and effective indicators of human capital while investment-based (i.e., education, training indicators are seen as indirect predictors of human capital (Marvel, Davis & Sproul, 2016). Investment in education is commonly measured or assessed by years of education or completion of a university degree, while completion of formal education is appropriate other approaches such as the discipline, or diversity and outcome-based measures should be considered. Considerable progress has been made globally in terms closing the gap of school attainment but researched has emphasized the importance of cognitive skills and performance for economic growth (Hanusheck, 2013). Knowledge, skills, and abilities are promising dimensions of human capital outcomes.

Figure 14

Typology of Human Capital (Marvel, Davis & Sproul, 2016, p. 616)

	Investments	Outcomes
Impart	Education – investments in learning activities of explicit knowledge. ▪ Vary from general to specific types of education. ▪ Vary in cost, diversity, and length of investment.	Knowledge – understanding of principles, facts, and processes. ▪ Clustered within domains such as those learned through formal education. ▪ Vary from generic to specific.
Develop	Training/experience – investments in learning by doing activities. ▪ General or specific to context (e.g., industry) or task (e.g., prototype development). ▪ Vary in terms of cost, amount, time, and type.	Skills – observable application of knowledge to create solutions to problems or complete specific task. ▪ Specialized or domain specific skills (e.g., industry or task-specific). ▪ Vary in type from novice to expert.
Acquire	Recruitment – Investments in recruitment activities to acquire abilities. ▪ Sources may include venture team, firm alliances, network ties, external R&D, etc. ▪ Vary in cost, form, and quality.	Abilities – Enduring, trait-like characteristics useful to range of tasks. ▪ More general with implications to wide range of contexts and tasks. ▪ Difficult to internally develop compared to knowledge or skills.

Figure 14 presents a table that aims to deconstruct the complexity of human capital by showing specific types of realised human capital from investments.

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The second aspect closely linked to human capital development is health and nutrition. Nutrition is essential for the achievement all the SDGS, and directly linked to the second goal which addresses hunger. Nutrition impacts the important phases of growth and development which are the first 3 years of life, plus life in the womb as this is the most critical time that basic human capital is formed. This is an important period in terms of mental, physical, social, and emotional development according to (Macdonald, 2002), most growth failures occur between 6 and 24 months of age.

New arguments raised by development agencies emphasise improving health and nutrition (micro-nutrients) as a way of developing human capital highlighting health issues that impact

attainment, performance, and learning outcomes. Others have also shown a direct connection between health and learning which is part of a larger issue. Malnutrition can hinder children from making the most of a formal education, even if they try to ignore its effects. There are also indications that childhood malnutrition has been associated with structural and functional impairment to the brain, as well as permanent cognitive effects (Dewey & Begum, 2011).

Social Entrepreneurs

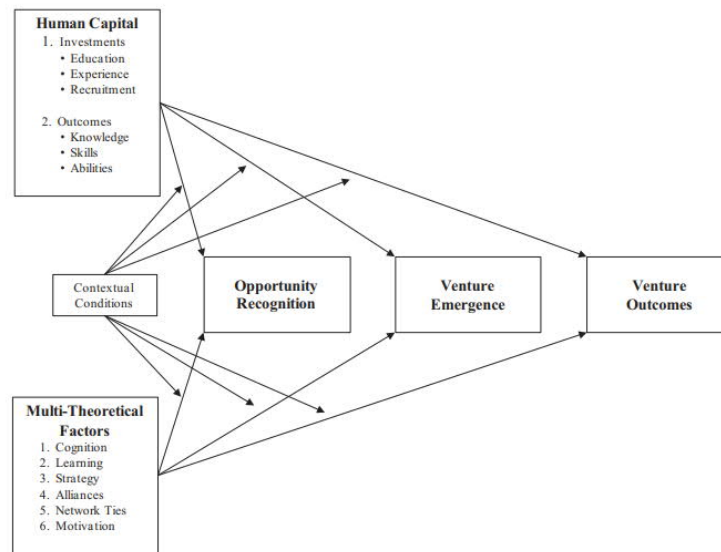
Social entrepreneurs (SE) can utilise their unique skills, circumstances, and resources to facilitate the creation of shared value by improving people's lives, leading to inclusive growth (Azmat, Ferduos & Couchman, 2015). Their purpose is to drive social change bringing about benefits that transform society. They are critical to inclusive growth by placing emphasis on people and social cohesion effecting social and economic transformation (Baskaran, Tang & Thiruchelvam, 2019) as they leverage resources to address social problems, using business principles.

Nutrition is essential for growth and development of children, it enables them to be healthy, productive members of society. Investments in nutrition programs and interventions to address child undernutrition indicate economic payoff and positive knock on effects for other development interventions. Growth promotion and development programs that integrate early childhood development programs with caregiver education is critical. Remedial efforts targeted at young children such as early childhood development feeding programs, primary school health and nutrition programs help children perform better at school.

A third aspect to consider is the impact of poor education and poor cognitive skills resulting in insufficient human capital to generate innovation and entrepreneurship which is needed for economic development.

Figure 15

Model of Human Capital and the Entrepreneurship Process (Marvel, Davis & Sproul, 2016, p. 616)



The model shows that human capital is critical throughout the different phases of entrepreneurship and that it influences the transition from one stage of the process to another.

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Education provides entrepreneurs with cognitive skills to better evaluate and exploit entrepreneurial opportunities, increasing the confidence levels while reducing perceived risk and enhancing human capital (Jimenez & Jimenez-Equizabal, 2015). Education influences the level of entrepreneurship, as the characteristics and quality of initiatives impact their sustainability. It affects the ability to develop, introduce and adopt new technologies and methods of production to enhance efficiency levels. Innovation is a vital source of economic growth and development.

The ability of individuals to adapt to changing economic environments is positively related to their level of human capital (Schultz, 1975). Human capital activities involve not merely the transmission and embodiment in people of available knowledge, but also the production of new knowledge which is the source of innovation and of technical change which propels all factors of

production (Mincer, 1981). Increases in technological change relate to knowledge creation as technology complements skills with education, in turn inducing technical change.

Evidence suggests that entrepreneurs frame problems differently (Dew, Read, Sarasvathy & Wiltbank, 2009). “They need to discover, exploit or create opportunities” brought about by knowledge (education), actions, and learning new ways to produce products or services” (Marvel, Davis & Sproul, 2016). Entrepreneurial activity is an important determinant of innovation, productivity growth, competitiveness, economic growth, and job creation.

Business Entrepreneur

A Business entrepreneur (BE) is an innovator that puts ideas into practice. According to Joseph Schumpeter they create either a new good or service or produce and deliver an existing good or service in a new way or to a new market. Many researchers have identified that entrepreneurs can invigorate the economy by reshaping the economic landscape through innovative technologies thereby creating new job opportunities in the short and long term. It is seen as a gateway to enhancing employment and income-generating activities.

Conclusion

The question is what needs to be addressed first economic, quality institutional, human capital or nutrition development or are these aspects mutually exclusive or coexist able.

The aim of economic development has been identified to address poverty (inequality and unemployment) which is dependent on human capital development through quality education and skill development and quality institutions. Factors affecting economic development include the social, economic, and political environment influenced by institutions which are shaped over centuries by human behaviour and motivations thus, change tends to be a slow process. Institutions are fundamental determinants and human and physical capital proximate determinates for economic development.

Human capital development determines the success and existence of quality institutions. The theory of investment in human capital was built on the significant amount of evidence indicating

highly educated and skilled individuals almost always tend to earn more than others (Becker, 1964, p. 12). Human capital development enables labour market participation, increasing income thereby reducing poverty allowing people to afford better diets, improved health care and living conditions.

Studies have also noted the importance of human capital to “discovering and creating entrepreneurial opportunity” (Marvel, Davis & Sproul, 2016). Compelling evidence shows that human capital is necessary to promote entrepreneurship characteristics. There are numerous arguments in the field of entrepreneurship highlighting the distinctive importance of human capital and prior knowledge.

Investments in different sources of human capital include both qualitative and quantitative factors such as quality education, nutrition, and health, with education as the vehicle and nutrition and health the fuel. Nutrition is the foundation for human capital which is fundamental for human growth and development which influences mental and physical capacity. Nutrition is central to development and economic and social improvements depend on nutrition.

The answer to the question is that nutrition is the starting point while the other elements need to coexist.

Overall conclusion

Malnutrition slows economic growth and perpetuates poverty in three ways:

- direct loss in productivity from poor physical status
- indirect loss from poor cognitive function and deficits in schooling
- loss incurred due to increased health care costs

Scaling up nutritional programs is imperative due to its widespread prevalence, effect on productivity and development and its extraordinary high benefit-cost ratio's (The World Bank, 2006).

According to (Bailey, West Jr, & Black, 2015) nutrition is considered to be “the most powerful adaptable environment factor that can be targeted in order to reduce the burden of disease across an individual's entire life span”. The return on investment is high for the provision of micronutrients is high as micronutrient deficiencies are preventable.

Figure 16

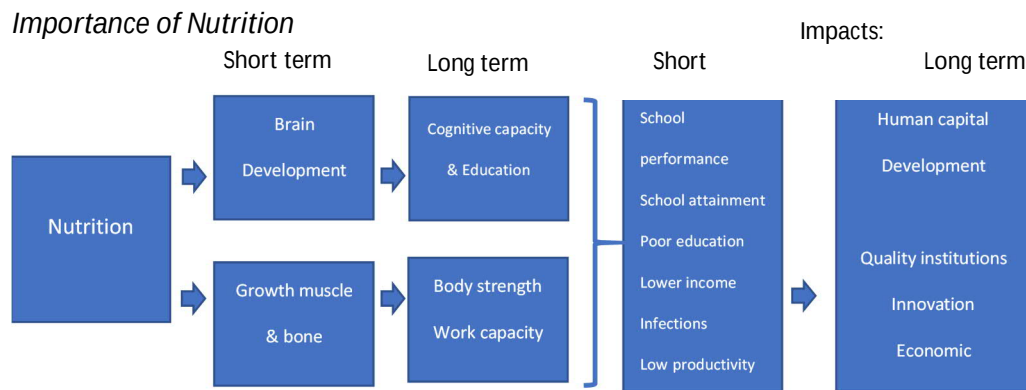


Illustration representing short- and long-term consequences and importance of nutrition (Uauy, Kain, & Corvalan, 2011, p. 1760) Note. This Image is Copied in Terms of Section 12 of the Current SA Copyright Act

Noting the important role of nutrition and the impact of intergenerational malnutrition more needs to be done. The consequences of malnutrition are largely irreversible, negatively impacting individuals through the different phases of life. Nutritional status is the build the foundation for human capital development which is a key factor for economic development.

Breaking the vicious cycle between poverty and malnutrition is vital, reducing poverty or increasing poverty will not automatically reduce malnutrition as it requires behavioural changes at an individual or household level but by addressing malnutrition through the introduction of nutritional programs that focus on pregnant women, infants, and young children which directly impacts human capital development ensuring a strong foundation.

Poor health, poor education and malnutrition are manifestations of institutional failures; quality institutions are the pillar for the strong economic development and performance.

Implementing integrated interventions that include nutrition, education, and healthcare are required to ensure optimal and sustainable human capital development.

Intervention at conception and in the first 1000 days of life has been identified as being the most effective for breaking the cycle of malnutrition (Bailey, West Jr, & Black, 2015). This phase is a small window of opportunity to sustainably reduce malnutrition.

Section 3: Research Methodology

Introduction

Mauch and Park (2003) noted that the choice of a research method influences the outcome of a study and it should be efficient, practical, and readily available.

This section identifies and describes the research paradigm, design, procedures, and methods used to collect, process and analysis of the data. It also describes the reliability and validity measures implemented to ensure credibility of the research.

Nutrition is a powerful adaptable environmental factor that can be targeted to reduce the burden of disease across an individual's entire life span (Bailey et al., 2015).

Income has been noted to be a key factor that influences access to nutritious food and is dependent on education, and skills to enable individuals to find or create employment.

This research aims to investigate how income and other determinants affect nutrition.

Assessing the relationship between:

- household income and consumption of nutritional food
- nutritional awareness and eating healthier
- caregivers' practices, behavior, attitudes, and consumption of nutritional food

Research Paradigm

This section presents the research paradigm and approach selected and the rationale for selecting this approach. (Saunders et al, 2007) developed the research onion that describes the different stages through which a researcher must pass when developing an effective methodology (Saunders, Lewis, & Thornhill, 2007). The principle being that one starts from the outside and as the researcher peels away each layer until the core is reached (Stainton, 2021).

Primary Research Assumptions

A research paradigm according to Kuhn (1970) is “the set of common beliefs and agreements shared between scientist about how problems should be understood and addressed” (Perera, 2018). It is characterised by the way scientists respond to ontological, epistemological, and

methodological questions. There is no single “best” research philosophy as each contributes a different and valuable way of viewing the organizational world.

Paradigms are viewed as a set of ideas, concepts, or perspectives used to view the world. ontologies, epistemologies and axiological are the three main concerns that guide the research design.

- Ontological is about the nature of the world and reality, this determines what research objectives will be focused on and how one sees and approaches them.
- Epistemological is about assumptions regarding knowledge contributions that can be made because of the research conducted and takes the position on what constitutes acceptable knowledge
- Axiological refers to the part that values and ethics play within the research process, incorporating the researcher’s judgement of value and how they deal with the values of research participants

Epistemological is the paradigm selected for this research paper and is defined as “a way of understanding and explaining how we know what we know” (Ahmed, 2008, p. 4). Epistemological is the study of knowledge and attempts to identify what is truly knowledge and accurately reflects reality. It is the process used by the researcher to know that truth is quantitative. The aim is to come to an understanding of things and how we can figure out what reality and investigating the most valid ways to reach the truth (Research article.com, 2019).

Objectivism is the epistemological stance which means that the mind of the researcher is separate of what is being researched in assessing if income or other factors influence nutrition.

Philosophy assumptions are influenced by the objectivism – subjectivism continua in terms of where the assumptions fall:

- Objectivism focuses on structure and is neutral by not allowing the facts to be influenced by the researcher’s personal values and biases it is focused on the discovery

of truth by means of observable and measurable facts. The information is not altered because of opinion.

- Subjectivism focuses on the subject and incorporates assumptions of the arts and humanities, it bases judgment on the researcher's personal impressions, opinions, and feelings instead of external facts and is focused on the social actors' opinions, narratives, interpretations, and perceptions. The researcher is not using facts but rather their opinion.

Positivism, critical realism, interpretivism, postmodernism, and pragmatist are five major philosophies that structure and organize research.

Positivism limits the role of the researcher to data collection and the objective interpretation thereof, it is dependent on quantifiable observations leading to statistical analysis. It is underlined by quantitative research in comparison to interpretivism which is underlined by qualitative research both are fact related paradigms as they attempt to find "the truth", whether it is conceived of as objective or relative. The use of quantitative research emphasizes the need to stay objective during the research process and remain neutral so that the information is not influenced by the researcher's views, values or bias'.

Research Strategy

The entire process from conceptualizing the research problem and defining the research questions, literature review, collecting, analysing, and interpreting the data is called the research strategy. The research strategy guides the researcher on how to conduct research, with three approaches identified:

- Quantitative
- Qualitative
- Mixed research method

This research is based on the quantitative method, which McNabb (2013) defined as "using numbers to describe data and the data is analyzed statistically" (Ntshiqqa, 2018, p. 46). The

information is collected in the form of numbers and translated into data to understand and explain the research question.

As pointed out by Bryman (2016) the relationship between the theory and research is deductive. Kumar (2014) highlighted that the quantitative method attaches “a high value to the validity and reliability of the findings and its conclusion can be generalized” (Ntshiq, 2018, p. 46).

Quantitative research can be used to find patterns, test causal relationships, make predictions, and generalize results to a wider population. It can be used for descriptive, correlational, or experimental research (Bhandari, 2020). Through sampling methods, the results can be generalized to broader populations.

Quantitative research encompasses a range of methods concerned with the systematic investigation of social phenomena using either statistical or numerical data. The aim is to analyze trends in data and relationships. (Guba & Lincoln, 1994).

The quantitative approach has been selected as the best methodology for this research as the aim of the research is to articulate facts and reveal patterns. The research results can also be projected to a larger population (Formplus Blog, 2020). Quantitative data will be collected based on surveys using questionnaires to address the topic.

Research Design

Research design according to Bryman (2016) is a framework that helps generate evidence to address the research questions and is the criteria used to evaluate the research. It is a blueprint, or overall plan, for conducting a study to ensure that maximum control is exercised over factors that could interfere with the validity of the research results.

There are five types of research design cross sectional, experimental, longitudinal, case research and comparative design (Bryman, 2016).

A cross sectional study was used in this research by collecting data from many different individuals at a single point in time. Variables are observed but not influenced. The benefits of a

cross sectional study are that it's cheap, less time consuming and an easy way to gather data and identify correlations. Cross sectional studies can be used for analytical and descriptive purposes. For this research paper, descriptive studies will be used to summarize the outcome based on descriptive statistics.

Procedures and Methods

This section will provide details on how the research was conducted, explaining the type of instrument used to collect data, the target population and sampling techniques used, and the ethical considerations applied. It also includes the aspects of collection, processing and analysis, and storage of the data.

Data Collection Instrument

Data collection is one of the critical parts of any research project, the most common methods are in the form of questionnaires and interviews (Bryman, 2016). There are two forms of data primary or secondary data, primary data is collected directly from data sources through surveys, interviews, experiments, etc. and secondary data is data collected by someone else in that is made available for others to use. In a survey the participants complete the forms compared to an interview where the researcher completes the forms. This study opted to utilize questionnaires which is basically a structured interview.

Kumar (2014) explained that the researcher can distribute the questionnaire to participants via email, mail, or collective administration.

McNabb (2013) stated that it is important that questions in a questionnaire should be clear and the wording understood by all participants, they should also be short, organized logically and to avoid double-barreled questions.

Targeting and Selecting Respondents

Target Population. McNabb stated that the target population is referred to as the set of elements that are measurable such as customers, students, households, products, or any other item that is of interest to the researcher, also called a universe. Bryman (2016) noted that sample is

selected from the target population. A similar view shared by Kumar (2014) is that the research population is the “universe from which a sample is selected” (Ntshiqe, 2018, p. 52).

When conducting quantitative research, it is most suitable to use large samples to make predictions about a target population. The intention of this research is to conduct a study of households in Johannesburg. As it is extremely difficult to reach all households in Johannesburg for this research, for empirical reasons a sample of the population will be examined.

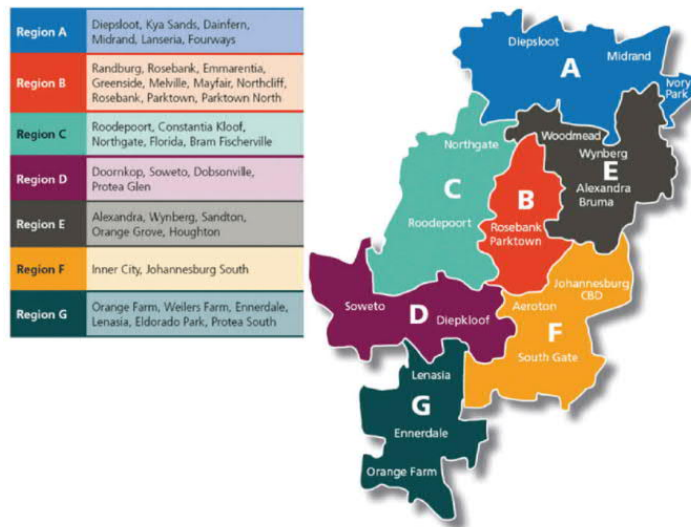
The selected participants should be based on the focus of the research topic in order to allow the researchers to meet their research objectives thereby answering the research questions. El-Gohary, (2010), quoted Krathwohl, (1997) definition of sampling procedures as: “The ways of selecting a small number of units from a population to enable researchers to make reliable inferences about the nature of that population” (El-Gohary, 2010, pp. 4-9).

The sampling design will include the following steps: -

- Basic characteristics that need to be considered when determining the research population include:
 - The individual should be 18 years and above.
 - Household heads or contributors.
- The definition of the population frame.
- The sample size will be households in Johannesburg the largest and most diverse city in South Africa. The population consists of distinctly different classes of households in South Africa, which are primarily grouped in different locations e.g. suburbs, townships, and informal settlements. Johannesburg is an ideal location for conducting this study.
- There are seven regions within the City of Johannesburg: grouped as Region A – Region G with several areas within.

Figure 17

Map of Johannesburg showing the 7 regions of the city (www.pikitung.co.za)



Map of Johannesburg showing the 7 regions of the city. Source: <http://www.pikitung.co.za/contact-us/>

Sampling Selection

Different techniques are used to select cost effective and reliable samples. Samples are used by researchers to make decisions based on probabilities (McNabb, 2013). Sampling allows the researcher to “infer information about a population based on the results from a subset of the population”, it also enables a reduction in cost and workload. The individuals selected in the sample need to represent the whole population. The different sampling techniques can be divided into two groups: probability (random) and non-probability (non-random) sampling with each having advantages and disadvantages. The researcher needs to decide on what or who will be sampled, the sampling technique and the number of samples that will be collected.

This research selected to use non-probability sampling method specifically convenience sampling as this method allows participants to be selected based on availability and willingness to participate. The disadvantages associated with this method include significant bias, the sample may not represent all characteristics.

Pilot study

According to Invalid source specified., pilot testing refers to “testing the questionnaire on a small sample of respondents to identify and eliminate potential problems”. The aim is to ensure that respondents understand and will have no problems in answering the questions as well as to ensure that there are no problems in recording the data. Invalid source specified. views the pilot study as an assessment for the researcher on validity of the questions and the reliability of the data that will be collected.

A pilot study was conducted and consisted of 65 participants from various areas such as Alexandra, Diepsloot, Fourways, North Riding, Tembisa, Midrand.

Problem areas identified included:

- the questionnaire contained was too long and took more than 10 minutes to complete, participants were reluctant to complete it as it was time consuming
- the questions were complicated and not clear resulting in participants having to clarify while completing the survey
- the options provided for the answers were broad and, in some instances, not relevant
- all of this impacted on the amount of time and resources needed to complete the survey.

By conducting the pilot study, I was able to design and execute the main project in a methodologically rigorous way that would allow me to save time and costs by reducing the risk of problems. It was useful and it assisted me in the following areas:

- refining the set of questions
- testing the research instrument selected which was survey questionnaires
- evaluating and deciding on research methods
- gauging whether the research goals and design were realistic
- estimating the time and costs required to complete the project.

Research-ethics Ethical Considerations

While conducting research the researcher is actually entering into the private space of respondent of which researchers need to be reminded of the fact while they are conducting their research as this raises a number of ethical issues that needs to be addressed in preparation, during and after the research has been conducted Invalid source specified.. Participation in the research topic should be completely voluntary and the identities and records of participants need to be kept confidential in addition the rights, values, needs and desires of the participants need to be respected which is the responsibility of the researcher (Creswell, 2003).

Each researcher is required to apply for ethical clearance from the ethics committee. The application process includes the completion of a set of documents to assess the research project data, summary of risk level, data collection approach, research participants and informed consent.

The student was granted permission by the School of Graduate School of Business Administration Ethics Committee of the University of the Witwatersrand to conduct research. Appropriate steps were taken to assure the respondent's confidentiality, rights and dignity as the researcher observed strict ethical guidelines which was addressed in the following manner:

Adherence to strict ethical guidelines in the conduct of the research was addressed in the following manner:

- Voluntary participation
All respondents were informed that the research was for academic purposes only, no one was coerced to participate as participation was voluntary. All participants were above 18 years of age.
- Harm and risk
No respondent was harmed or put at risk due to their participation.
- Trustworthy and honesty

Was maintained by adhering to strict ethical guidelines and avoiding any deception or exaggeration about the aims and objectives of the research. Honesty and trustworthiness were maintained during both the data collection and analysis process.

- Privacy, confidentiality, and anonymity

No personal information or identifying characteristics were requested from participants ensuring that no information will be kept that could reveal the participants' identity.

Data Collection and Storage

Questionnaires and interviews are the common methods used for data collection which is also forms a critical part of a research project. For this study followed a structured approach for data collection with a questionnaire used as the basis. As primary sources were used for data collection Kumar (2014) listed that observations, questionnaires, and interviews are useful methods.

The mode used for data collection was hard copy questionnaires, the advantages being that it is inexpensive, convenient, and quick way to collect data. I selected this mode to reach participants in poorer communities who may not have access to email or data.

The questionnaire contained closed ended and was divided into two sections: biographical and nutrition related.

There several ways to store raw data, Creswell (2013) highlighted that the method depends on the type of information collected. The researcher should maintain a master list of all information gathered from participants. Hardcopies are stored.

Data Processing and Analysis

Descriptive and inferential statistics are the two types of statistics used in quantitative research strategy according to McNabb (2013). Raw data is collected which the researcher needs to ensure is clean and free from inconsistencies and incompleteness. Once the data is clean it is then coded. During the coding process the data is broken down, conceptualised, and then integrated to form a view. Computer programs is available to assist with the data analysis process that assist the researcher by allowing them to create, modify and analyse large volume data. According to Kumar

(2014) during the analysis process the researcher should first examine the question or variable on its own and then examine the all the responses. Responses should be tabulated with each question counted, which is referred to as frequency distributions. The responses were captured into excel.

The researcher's aim during the analysis process is to order the data and determine its meaning, assessing if there are relationships between the findings and the research questions and objectives. There are several data analysis procedures in quantitative research some of the procedures listed by McNabb (2013) include multivariate procedures, path analysis, multiple regressions, partial regression, analysis of covariance, factor, and cluster analysis.

The researcher utilised the chi test, spearman's rho, analysis of variance (ANOVA) and regression analysis to analyse the data.

Reliability and Validity

Reliability

Robson, (2002) defined reliability as: "The extent to which a measuring device, or a whole research project, would produce the same results if used on different occasions with the same object of study" (El-Gohary, 2010, p. 4).

Different techniques are available to ensure internal data consistency the most common one being Cronbach's Alpha which is used to measure reliability. A high coefficient alpha doesn't necessarily mean a high degree of internal consistency as the length of the test affects the alpha. Different studies indicate that 0.70 to 0.95 is an acceptable alpha range value.

The main concern regarding reliability is about accuracy of the actual measuring instrument or procedure.

Validity

Invalid source specified. has indicated that validity refers to the degree to which a study accurately reflects or assesses the specific concept that the researcher is attempting to measure.

Validity as a tool assesses whether the research measures what's supposed to be measured, and whether the research instrument allows you to meet your research objectives. A series of questions can also be asked while looking for answers in other research projects.

- External validity which refers to the generalization of the results. There are several ways to assess this e.g. type of sampling selected.
- Internal validity which has to do with the design of the study, this relates to
 - o Decision taken on what should and should not be measured
 - o Extent of considerations taken by the researcher and their explanations for other casual relationships identified

The main concern regarding validity is the researcher's success at measuring what they set out to measure.

Section 4: Data Analysis

Descriptive statistics were used to calculate the frequency, mean and standard deviation of the following questions. The aim of the research survey was to assess the influence of income on the consumption of fruit and vegetables, the drivers behind healthy eating and awareness of the impact of food on our well-being and development of children.

IBM SPSS Statistics software was used for conducting the statistical analysis.

There are 104 observations

Table 4

Summary and Analysis of Some Questions

Questions	Analysis of responses
What I eat affects my health and well-being?	70.2% of the sample agree that what they eat affects their health and well-being.
Do you know the daily nutrient requirements needed by children for health, growth and development?	53.8% of the sample do not know the daily nutritional requirements needed by children for health, growth, and development.
When choosing a snack what comes to mind?	33%: packet of chips or popcorn, 26%: fruit or vegetables 22.1% biscuits or cake 8.7%: chocolates or sweets 9.6%: other
How often do you eat fruits and vegetables (5-7 servings or portions)? Which is recommended.	only 23.1% of the sample eat the recommended amounts
How often do you skip meals or cut down your meal size because you don't have enough food?	More than 50% of the sample skip a meal or cut down on their meal size as a result of not having enough food, at varying degrees
Do you know the nutritional content of your food?	Only 30.8% of the sample know the nutritional content of the food while 67.3% don't know the nutritional content of their food.

As the data is categorical, we will use binary logistic regression this will enable us to understand how changes in the independent variables are associated with changes in the probability of an event happening.

Ordinal logistic regression

Variables	Model Fitting information	Goodness of Fit- Pearson	Goodness of Fit- Deviance	Pseudo R-Square Nagelkerke	Test of Parallel Lines
Requirements	Less than 0.05	Greater than 0.05	Greater than 0.05	values provide an indication of the amount of variation in the dependent variable explained by the model	Greater than 0.05
When choosing a snack what comes to mind? Income, Education, Age	0.035	0.244	0.813	0.202	0.485
What determines the type of food bought for the household? Income , Education, Age	<0.001	0.952	0.985	0.309	0.999

The spearman's rank correlation is often used to evaluate relationships involving ordinal variables.

Table 5

Spearman's Rho assessment

Variables	Spearman's rho	Significance
Income	0.482**	<0.001
Education		
Income	0.369**	<0.001
How often do you skip meals or cut down your meal size because you don't have enough food?		
Income	-0.222*	0.029
How often do you eat fast food?		
Education	0.300**	0.002
How often do you skip meals or cut down your meal size because you don't have enough food?		
Education	-0.293**	0.003
How often do you eat fast food?		
How often do you skip meals or cut down your meal size because you don't have enough food?	0.221	0.029
Eating between 5 and 7 portions of fruit and vegetables daily is affordable		
**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).		

The Chi-Square Test for Association is used to determine if there is any association between two variables the purpose is to determine if a difference between observed and expected data is due to

chance or if a relationship between the variables does exist. It is really a hypothesis test of independence or no association.

- Pearson Chi-Square should be below 0.05 to be significant.
- Cramer's V is a measure of association and tells us how important our findings are, an outcome greater than 0.3 is a strong relationship

Table 6

Chi-square test

Variables	Pearson chi-square	Cramer's V
Would knowing the nutritional content of your food affect your decision to buy it? Maintaining a balanced diet?	0.017	0.356
Do you know the nutritional content of your food? Do you know what the requirements are for a <u>balanced diet</u> for children?	0.003	0.343
"Do you think that food might affect children's mental performance?" (Brands, 2011) "Do you think that what children eat affects them physically?" (Brands, 2011)	<0.001	0.373
Do you know the daily nutrient requirements needed by children for healthy growth and development? "Do you think what children eat affects their behaviour/mood?" (Brands, 2011)	0.002	0.300
"Do you think that what children eat affects them physically?" (Brands, 2011) Do you know what the requirements are for a <u>balanced diet</u> for children?	0.002	0.316
Do you think that food might affect children's mental performance? "Do you think what children eat affects their behaviour/mood?" (Brands, 2011)	<0.001	0.446
Would knowing the nutritional content of your food affect your decision to buy it? "Do you think what children eat affects their behaviour/mood?" (Brands, 2011)	0.002	0.317

* questions from (Brands, 2011) were utilised in the survey

Table 7

One-way ANOVA

Variables	Test of homogeneity of variances	ANOVA	Robust tests of equality of means - Welch	Robust tests of equality of means – Brown - Forsythe
When choosing a snack what comes to mind Education	0.029	<0.001	0.010	0.004
Do you think that food has an effect on children's wellbeing and development? Education	<0.001	<0.001	0.015	0.012

Section 5: Development Entrepreneurship Business Model

Introduction

The initial aim of my proposal was to find a sustainable way to increase food security in urban households with an emphasis on backyard food production. I soon realised that this was only a temporary intervention and not a long-term solution. Back yard farming aims to providing households with nutrients and requires a number of considerations such as “undergo a behavioural process when faced with the decision of whether they should farm” (Nugent, 2000).

Figure 18

Factors affecting households' decisions regarding urban agriculture adaptation (Nugent, 2000)

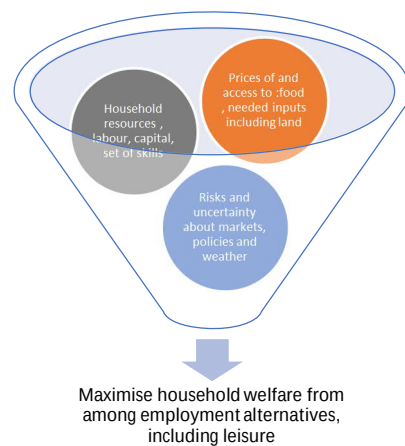


Figure 18 is an adaption illustrating the different constraints that households encounter when deciding on whether they should participate in urban agriculture.

Concerns raised with this solution was that there is only a small amount of urban farming that households with space can participate in, with many not having any spare space to utilise. The concept that they could earn income from selling their produce is not plausible due to the limitations on quantity and quality. Eating fruits and vegetables provide nutrition but not satiety and would need to be eaten in large quantities which is not affordable.

Part of this solution was to attempt alternative approaches to address the issue of space:

Figure 19

Images of Vertical and Bag Planting on the balcony. Experiments conducted by the researcher in trying to identify solutions to the challenge of urban agriculture to address micronutrient deficiencies.

Vertical gardens. Planting in a box.



Spinach and cauliflower growing in breathable material bags



The solution identified to reduce food security through urban agriculture to enable households to produce their own food, though this posed several challenges:

- Limited space
- Unhygienic environments in poor communities' poor sanitation
- Limited resources to purchase items (seeds, fertiliser, other items)

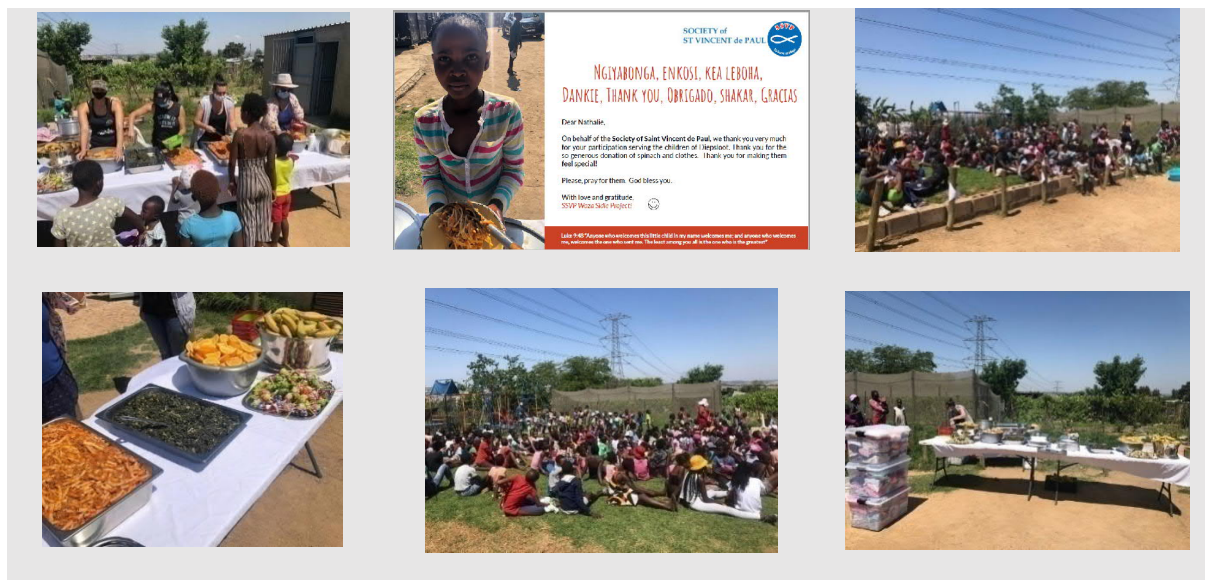
- Time to wait for the produce to grow while being hungry

Addressing food security requires more than vegetables and fruit making me realise that my aim should be to reduce malnutrition instead

My focus then changed to finding a sustainable solution to address malnutrition by providing children with nutrients during the growth and development phases of their life to ensure that they have full cognitive development and strong immune systems allowing for school performance and attainment giving them the opportunity to maximize their learning and development of skills enabling income generation either through employment or entrepreneurship.

Figure 20

Images from the SSVP Woza Sidle Project in Diepsloot, a project that the researcher participated in.



For a period of three months, I supplied the SSVP Woza Sidle project with spinach.

Malnutrition is a social problem which is explained as a social condition that disrupts or has negative consequences for society and is usually associated with poverty and the standard of living it can also be referred to as a wicked problem. It is difficult to solve because it is complex and interconnected and at times conflicting with other goals involving different stakeholders.

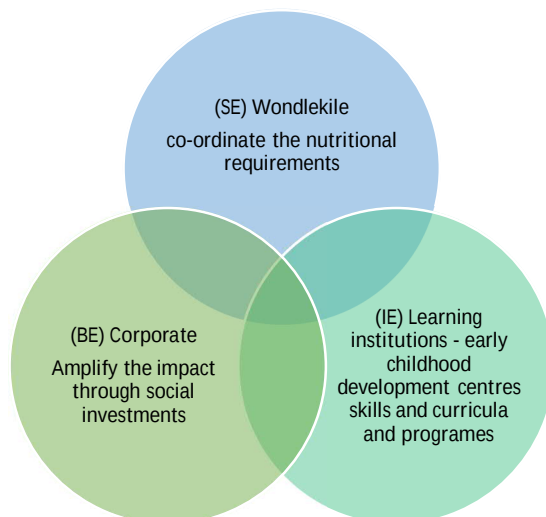
Trying to address malnutrition requires access and the availability of adequate nutritious food, healthy environments and adequate sanitation which are dependent on institutions as they control and influence the economic, political, legal, and educational landscape.

A multi sectoral approach and solution that includes interrelationship engagement between multiple actors is needed to address the challenge. The approached identified is development entrepreneurship as it encompasses:

- individual growth and development (nutrition and health) SE
- quality education and knowledge development (Education and related institutions) IE
- innovation and creation of opportunities (entrepreneurship) BE.

Figure 21

Development Entrepreneurship as Nexus of Social Entrepreneurship, Business Entrepreneurship, and Institutional Entrepreneurship (McMullen, 2011, p. 187). An illustration using the model to indicate the role players required for Wondlekile.



The focus of Wondlekile is to combine quality early learning with good nutrition.

As noted in the literature poor child nutrition and feeding practices are usually associated with poverty and poor environmental conditions. Research shows that access to quality early childhood development and nutrition are critical to breaking the vicious cycle of poverty and “protecting children against the effects of poverty, poor nutrition, inadequate health care and lack of education”

creating opportunity to offset inequalities and eradicate poverty (Ashley-Cooper, van Niekerk & Atmore, 2019, p. 87). Early intervention support programs can assist by providing children with the opportunity to grow and develop to their full potential.

This model is a blend of between profit goals and generating a positive return to society through the provision of micronutrient rich foods as micronutrient deficiencies “are associated with delayed psychomotor development and impaired cognitive function” (Michaelsen, Weaver, Branca & Robertson, 2003). The early years of childhood is the period in which a child acquires the skills, attitudes and concept which lay the foundation for life-long learning. “ECD is the source of human capital to drive education, jobs and growth” (Ilifa Labantwana & Kago Ya Bana, 2016)

The aim is to develop a food and nutrition assistance program that influences the types of foods provided to infants and toddlers together with nutrition education for women and caregivers by creating a partnership with ECD centres during this endeavour.

Figure 22

Human Capital Development Pathway (Ilifa Labantwana & Kago Ya Bana, 2016, p. 1)

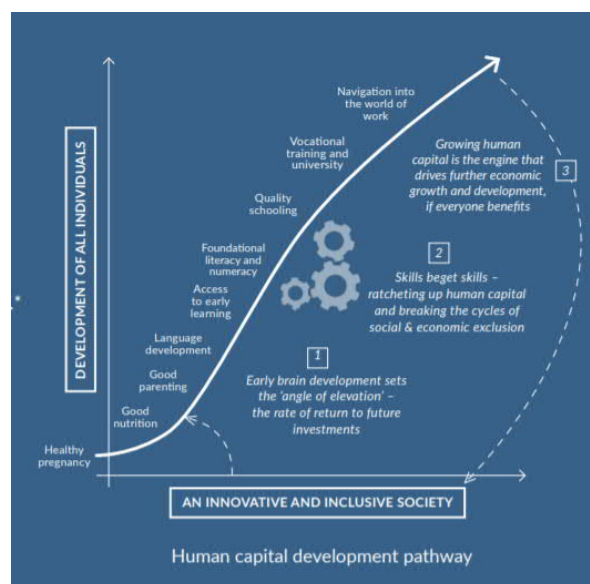


Figure 22 illustrates that importance of ECD and that it is the “source of human capital to drive education, jobs and growth.”

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Business Plan

Executive Summary

Wondlekile is a social entrepreneurship project developed to support and provide ECD centres with nutritious food namely fruits and vegetables in the first phase. The second phase would be to cook or process the food to support efforts to improve the children's nutritional status. Phase 3 would be to provide and support households with nutritious food.

A report compiled by SA Early Childhood Review 2016 revealed that over 6 million children in South Africa were under six years of age with 63% living in poverty (ETDP-SETA, 2020)

Vision

The goal is to increase access and availability of nutritious products. The aim of Wondlekile is to supply ECD centres with specific micronutrient rich food products that contribute to health, growth, and development while building the foundation of knowledge.

The work will be sustained through:

- Partnerships with retailers who sell vegetables and fruit and farmers that have excess produce that is unsold
- Lease land from government to farm certain products
- Seeking grants from government, foundations and trusts, and corporate social investments programs.
- Self-generated income from:
 - o The sale of smoothies and other products

Market

There are 3251 ECD's in Gauteng province with majority in Johannesburg. Growth is expected by increasing awareness and interest in nutritious food products in communities.

Table 7

Type of ECD Centre by Province (ETDP-SETA, 2020, p. 33)

Provinces	Community Based	Home Based	School Based	Other	Not Specified	Total
Free State	1127	169	209	7.00	347	1859
	60.59%	9.09%	11.24%	0.00	18.66%	
Gauteng	1092	1801	243	62.00	553	3251
	28.93%	47.72%	6.44%	0.02	14.65%	
Kwazulu Natal	1658	251	173	26.00	0	2108
	77.08%	11.67%	8.04%	0.01	0.00%	
Limpopo	2542	269	121	91.00	7	3030
	83.89%	8.88%	3.99%	0.03	0.23%	
Mpumalanga	1242	221	189	39.00	0	1691
	71.17%	12.66%	10.83%	0.02	0.00%	
North West	602	72	88	13.00	6	781
	74.32%	8.89%	10.86%	0.02	0.74%	
Eastern Cape	1323	352	206	27.00	73	1981
	66.75%	17.76%	10.39%	0.01	3.68%	
Northern Cape	387	20	48	20.00	0	475
	81.47%	4.21%	10.11%	0.04	0.00%	
Western Cape	1593	776	503	27.00	210	3109
TOTALS	11566	3931	1780	312.00	1196	18785
% Of Type	61.6%	20.9%	9.5%	1.7%	6.4%	

Source: Wazimap, 2016

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Description of Services

The services will include:

- Free assessments of their food programs
- Develop healthy and affordable menu's and meals
- Healthy snacks and salads
- Provide nutritional education and cooking lessons to caregivers
- Increase nutrition awareness
- Provide nutritional products

Table 8

The Initial Product offering

Product	Micronutrient
Spinach	Iron, Folate, Vitamin A
Carrots	Vitamin A
Oranges	Vitamin C
Milk	Calcium, Vitamin D

Wondlekile will have a kitchen that washes, cleans, chops, and packages the products making daily deliveries to the schools. The space required will be 50 square meters that includes a refrigerator/storage facilities and kitchen chopping utensils, tables, and vegetable processing area. All kitchen staff will receive food safety training.

The kitchen will be in Riversands incubation hub in Johannesburg.

The project will operate as a non-governmental organisation NGO as the aim is to promote change in broad-based area, the expectation is to scale-up the project to different geographic regions.

The kitchen will hire one full time staff person to manage the kitchen, with two half-time staff and a driver. Dietician and nutritionist students from the University of the Witwatersrand to consult and provide support to assess and create menu's and food programmes. Volunteers with media and marketing experience will be part of the organizing team to assist with media engagements.

Table 9

Overview of Financial Operational Requirements

Start-up overview		
Income statement	Monthly	Annually
Donations/grants	40 000	480 000
Expenses	32 520	390 240
Kitchen space (rental)	3100 ex vat	37 200
Staff wages (casual labour)	15 000	180 000
Delivery van rental	(239 per day x 30) = 7 170	86 040
Insurance	1 000	12 000
Fuel	2 500	30 000
Water and electricity	750	9 000
Administration expenses	3 000	36 000
Total (difference for contingencies)	7 480	89 760

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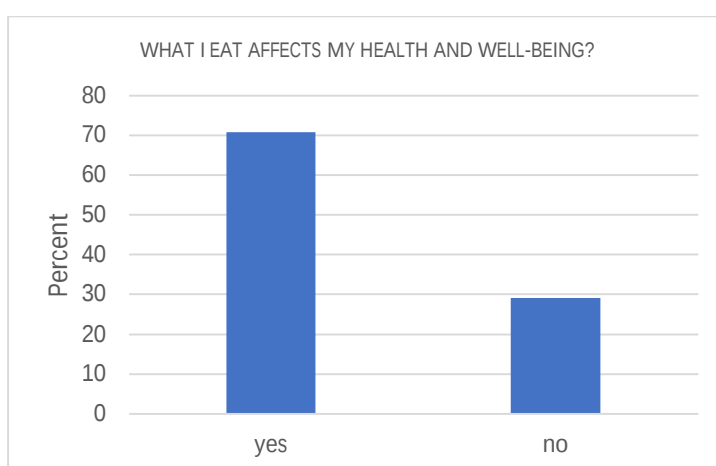
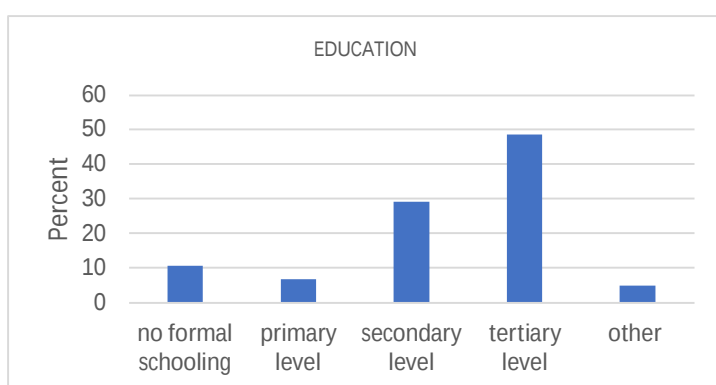
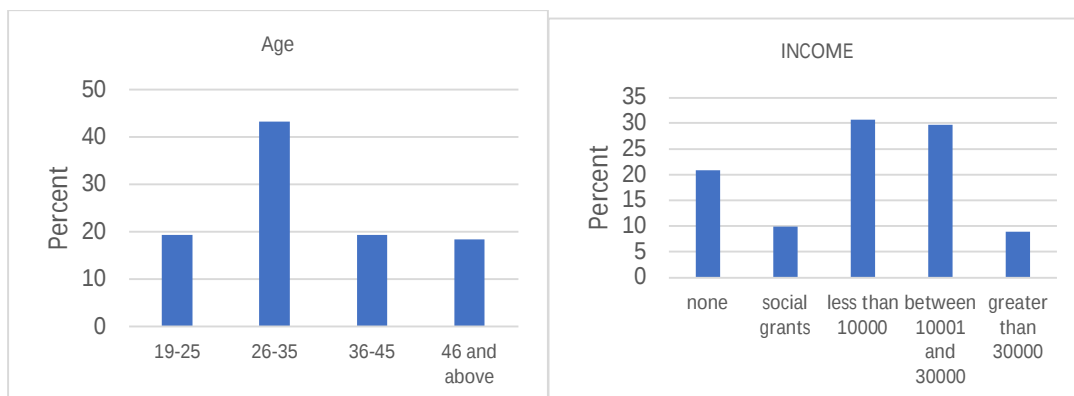
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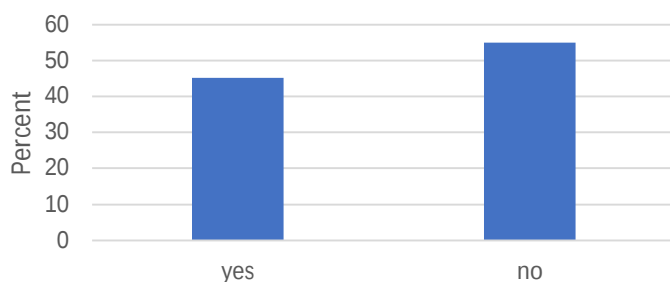
Appendices

Data Analysis



		N	%
yes		73	70.2%
no		30	28.8%
Missing	System	1	1.0%

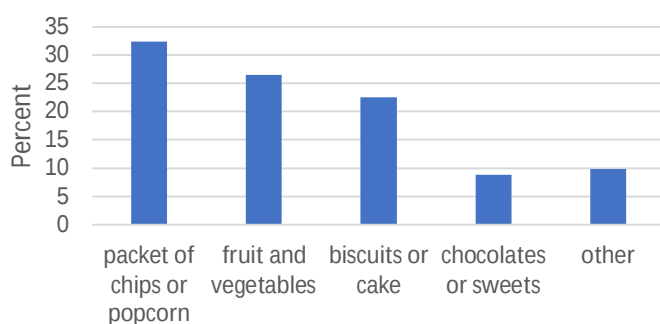
DO YOU KNOW THE DAILY NUTRIENT REQUIREMENTS NEEDED BY CHILDREN FOR HEALTH GROWTH AND DEVELOPMENTS?



DO YOU KNOW THE DAILY NUTRIENT REQUIREMENTS NEEDED BY CHILDREN FOR HEALTH GROWTH AND DEVELOPMENTS?

	N	%
yes	46	44.2%
no	56	53.8%
Missing System	2	1.9%

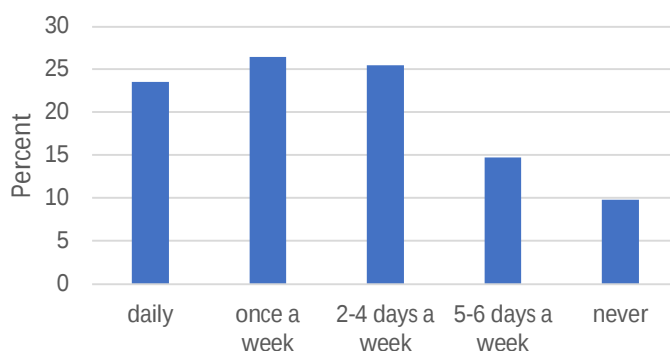
WHEN CHOOSING A SNACK WHAT COMES TO MIND



WHEN CHOOSING A SNACK WHAT COMES TO MIND

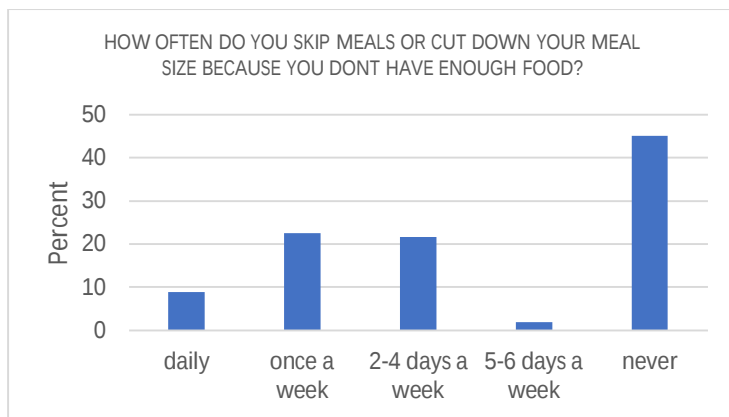
	N	%
packet of chips or popcorn	33	31.7%
fruit and vegetables	27	26.0%
biscuits or cake	23	22.1%
chocolates or sweets	9	8.7%
other	10	9.6%
Missing System	2	1.9%

HOW OFTEN DO YOU EAT FRUITS AND VEGETABLES(5-7 SERVINGS/PORTIONS)?



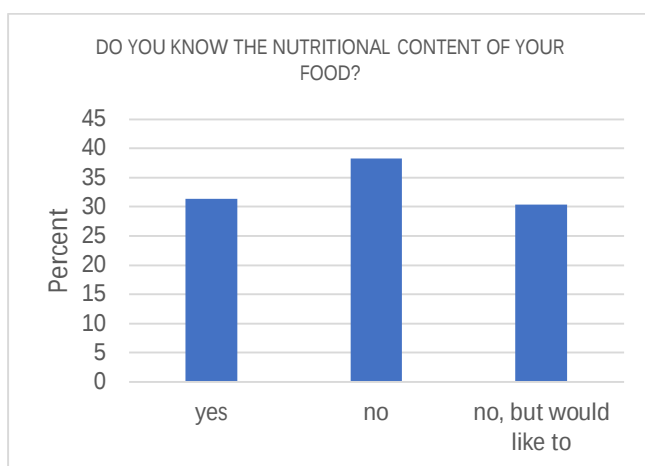
HOW OFTEN DO YOU EAT FRUITS AND VEGETABLES(5-7 SERVINGS/PORTIONS)?

	N	%
daily	24	23.1%
once a week	27	26.0%
2-4 days a week	26	25.0%
5-6 days a week	15	14.4%
never	10	9.6%
Missing System	2	1.9%



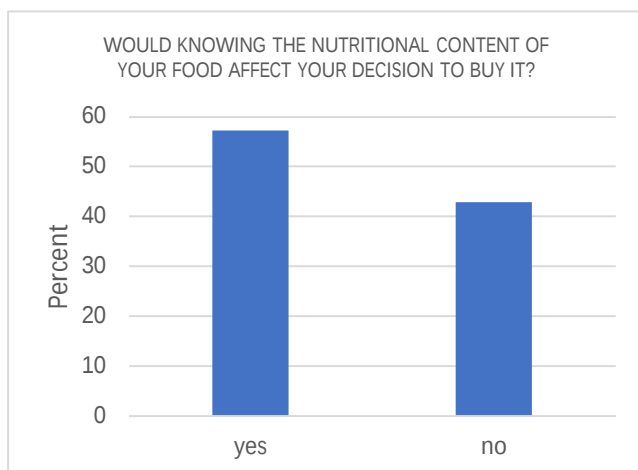
HOW OFTEN DO YOU SKIP MEALS OR CUT DOWN YOUR MEAL SIZE BECAUSE YOU DONT HAVE ENOUGH FOOD?

	N	%
daily	9	8.7%
once a week	23	22.1%
2-4 days a week	22	21.2%
5-6 days a week	2	1.9%
never	46	44.2%
Missing System	2	1.9%



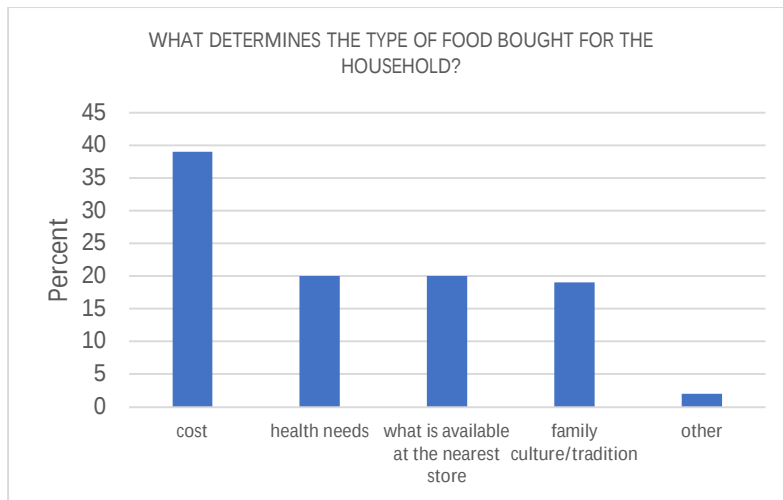
DO YOU KNOW THE NUTRITIONAL CONTENT OF YOUR FOOD?

	N	%
yes	32	30.8%
no	39	37.5%
no, but would like to	31	29.8%
Missing System	2	1.9%



WOULD KNOWING THE NUTRITIONAL CONTENT OF YOUR FOOD AFFECT YOUR DECISION TO BUY IT?

	N	%
yes	56	53.8%
no	42	40.4%
Missing System	6	5.8%



WHAT DETERMINES THE TYPE OF FOOD BOUGHT FOR THE HOUSEHOLD?

	N	%
cost	39	37.5%
health needs	20	19.2%
what is available at the nearest store	20	19.2%
family culture/tradition	19	18.3%
other	2	1.9%
Missing System	4	3.8%

Correlations

			Age	INCOME	EDUCATION	HOUSEHOLD MEMBERS	HOW OFTEN DO YOU EAT FRUITS AND VEGETABLES (5-7 SERVINGS/PORTIONS)?	HOW OFTEN DO YOU SKIP MEALS OR CUT DOWN YOUR MEAL SIZE BECAUSE YOU DONT HAVE ENOUGH FOOD?	HOW OFTEN DO YOU EAT FAST FOOD	EATING BETWEEN 5 AND 7 PORTIONS OF FRUITS AND VEGETABLES DAILY IS AFFORDABLE
Spearman's rho	Age	Correlation Coefficient	1.000	.148	.011	.185	-.111	.148	.004	-.155
		Sig. (2-tailed)		.140	.916	.064	.265	.137	.965	.125
		N	104	101	103	101	102	102	100	100
	INCOME	Correlation Coefficient	.148	1.000	.482**	-.066	-.074	.369**	-.222*	-.004
		Sig. (2-tailed)	.140		<.001	.522	.464	<.001	.029	.967
		N	101	101	100	98	99	99	97	97
	EDUCATION	Correlation Coefficient	.011	.482**	1.000	-.182	-.153	.300**	-.293**	.165
		Sig. (2-tailed)	.916	<.001		.070	.128	.002	.003	.103
		N	103	100	103	100	101	101	99	99
	HOUSEHOLD MEMBERS	Correlation Coefficient	.185	-.066	-.182	1.000	.070	-.001	.149	-.084
		Sig. (2-tailed)	.064	.522	.070		.493	.993	.145	.414
		N	101	98	100	101	99	99	97	97
	HOW OFTEN DO YOU EAT FRUITS AND VEGETABLES (5-7 SERVINGS/PORTIONS)?	Correlation Coefficient	-.111	-.074	-.153	.070	1.000	-.135	.154	-.046
		Sig. (2-tailed)	.265	.464	.128	.493		.177	.130	.653
		N	102	99	101	99	102	102	98	98
	HOW OFTEN DO YOU SKIP MEALS OR CUT DOWN YOUR MEAL SIZE BECAUSE YOU DONT HAVE ENOUGH FOOD?	Correlation Coefficient	.148	.369**	.300**	-.001	-.135	1.000	-.088	.221*
		Sig. (2-tailed)	.137	<.001	.002	.993	.177		.387	.029
		N	102	99	101	99	102	102	98	98
	HOW OFTEN DO YOU EAT FAST FOOD	Correlation Coefficient	.004	-.222*	-.293**	.149	.154	-.088	1.000	-.035
		Sig. (2-tailed)	.965	.029	.003	.145	.130	.387		.730
		N	100	97	99	97	98	98	100	100
	EATING BETWEEN 5 AND 7 PORTIONS OF FRUITS AND VEGETABLES DAILY IS AFFORDABLE	Correlation Coefficient	-.155	-.004	.165	-.084	-.046	.221*	-.035	1.000
		Sig. (2-tailed)	.125	.967	.103	.414	.653	.029	.730	
		N	100	97	99	97	98	98	100	100

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

* Correlation is significant at the 0.05 level (2-tailed).