Fill the Nutrient Gap

Namibia

Draft Summary Report

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Introduction to Fill the Nutrient Gap (FNG)

Improving nutrition for a healthy, productive Namibia

Maternal and child malnutrition is a national problem in Namibia with serious consequences for survival, growth, healthy development and economic productivity for individuals and society. In Namibia, 24 percent of children under 5 are stunted, 6 percent are wasted and half of all children under 5 are anaemic. These numbers vary regionally, with stunting reaching 37 percent (Ohangwena) and wasting reaching 10 percent (Omaheke) in some regions. Subsistence farmers and agricultural workers, forming the majority in labor force and backbone of Namibian economy, are particularly affected by malnutrition. Although progress has been made on all these indicators over the last years, the ongoing COVID-19 crisis shows heightened risk to fall back again and lose the advances made toward a healthy, well-nourished population.

Nutrition is a crucial pillar in the development of a healthy, productive nation. Good nutrition enhances physical and cognitive development, prevents disease, and increases the potential of the workforce and society. Improving diets, especially of children and women, brings immediate and long-term health, education and economic benefits. The two Lancet series (2013 and 2021) on maternal and child undernutrition identified a variety of nutrition interventions that have proven effective. Improving the nutrition situation in a country requires coordinated actions across the food, social protection, health and education systems, that are grounded in a good understanding of the local context, its opportunities and bottlenecks, and a synthesis of global and local evidence.

Malnutrition Overview

Namibia suffers a high burden of child undernutrition. The prevalence of stunting (low height-for-age) as estimated by Demographic Health Survey (DHS) has decreased from 29 percent in 2006/07 to 24 percent in 2013 for children under 5, classified as high by the World Health Organization (WHO). Recently analysed anthropometric data from the 2015/16 Namibia Household Income and expenditure Survey (NHIES) indicate that stunting may have increased between 2013 and 2015/16. Stunting prevalence varies between 37 and 13 percent (Ohangwena and Khomas, respectively) and is higher in rural (28 percent) than in urban settings (17 percent).

The prevalence of wasting (low weight-for-height) is 6 percent, classified as medium by WHO. Wasting prevalence was 8 percent in 2006/07, showing steady progress in reduction. Among women of reproductive age (WRA, 15-49 years old), around one in five (21 percent) have anaemia and 32 percent are overweight or obese (BMI >25). Overweight and Obesity is higher in urban (40 percent) than in rural areas (22 percent) and strongly associated with

wealth: 44 percent of WRA are overweight/obese in the highest wealth quintile, opposed to 13 percent in the lowest. Anaemia in pregnant women is around 26 percent. Malnutrition is intergenerational, passed on from mothers to children. Improving maternal nutrition across these indicators is essential to break the cycle of poverty and enable sustainable development.

All forms of malnutrition – undernutrition, micronutrient deficiencies and overweight/obesity – are the result of poor diets, inadequate knowledge and resources and unhealthy food environments. In response to the situation in Namibia, this summary report highlights gaps in adequate nutrient intake, shares an understanding of the barriers to accessing nutritious foods and identifies interventions that can improve access to nutritious diets, enabling better nutritional outcomes for the most vulnerable.

Building consensus for improved nutrition

Fill the Nutrient Gap (FNG) is an analytical process comprised of a secondary literature review in combination with Cost of the Diet (CotD) linear optimization to understand local drivers that affect the availability, cost and affordability of a nutritious diet. Solutions of interest for improving availability of nutritious foods, lowering their cost and/or increasing income are then assessed for their potential to improve affordability, using the CotD software. In this way, the context-specific potential for impact of proven interventions can be quantified.

This summary report presents findings from the analysis and a discussion of its process, methodology and limitations. It highlights recommendations and priorities identified by stakeholders. By identifying and contextualizing new findings, the FNG analysis contributes towards building consensus around a vision and a path forward for improved nutrition in Namibia in a sustainable way that is integrated across the country's food systems.

FILL THE NUTRIENT GAP: SITUATION ASSESSMENT FOR MULTI-SECTORAL DECISION-MAKING ON THE PREVENTION OF MALNUTRITION

Malnutrition has two direct causes: inadequate dietary intake and disease. The FNG assessment focuses on gaps in dietary intake to inform national policies and actions that can be taken across food, social protection, and health systems to improve nutrition, with a focus on the most vulnerable populations. The FNG considers whether nutritious foods are available, accessible, and affordable in a specific context, and identifies the barriers that lead to gaps in nutrient intake. The analysis focuses on the extent to which vulnerable people have choices in the foods they consume and how those choices are made. The FNG process identifies and models the impacts of context-appropriate interventions to improve diets and nutrient intake across food, health, education, and social protection systems. The results are used to identify entry points across systems, to refine programmes, and to make recommendations to policymakers.

The assessment comprises two components:

1. A country-specific review of secondary data and information on factors that reflect or affect dietary intake. This includes malnutrition trends over time, characteristics of the food system and food environment, and population behaviour related to food and feeding.
2. An assessment of the extent to which economic barriers prevent adequate nutrient intake. This uses the Cost of the Diet (CotD) linear programming software developed by Save the Children (UK), and includes modelling of the economic impact of possible interventions to increase nutrient intake and fill nutrient gaps.

Preventing malnutrition, including through improved access to nutritious foods, cannot be achieved by one sector alone. FNG is designed to inform multisectoral decision making and therefore engages stakeholders from all sectors including food, health, agriculture, education, and social protection.

It is the stakeholders who define the scope and focus of the assessment. They contribute data and sources of information for identification of context-specific barriers and entry points and together with the analytical team develop a shared understanding of the issues and possible solutions. They then identify appropriate nutrition-specific and nutrition-sensitive interventions that can be implemented by different sectors using their existing delivery platforms. These could be social safety nets, food processing and markets, antenatal care, school feeding programmes, etc.

The FNG methodology has been developed by WFP with technical support from partners including the University of California Davis, the International Food Policy Research Institute (IFPRI, Washington DC), Epicentre (Paris), Harvard University (Boston), Mahidol University (Bangkok), Save the Children (UK), and UNICEF.

Between 2016 and early 2021, FNG analyses were completed in 32 countries and, at the time of writing in March 2021, were ongoing in 12 countries with more in the pipeline.

For more information on the concept and the method of the analysis, see Bose I, Baldi G, Kiess L, de Pee S, The 'Fill the Nutrient Gap' Analysis: An approach to strengthen nutrition situation analysis and decision-making toward multisectoral policies and systems change. Matern Child Nutr 2019: DOI: 10.1111/mcn.12793

Process and Scope of the Analysis

In response to the Government of Namibia's goal of improving nutrition outcomes, the National Planning Commission under the Office of the Prime Minister, together with WFP, GIZ and IFAD conducted a Fill the Nutrient Gap (FNG) analysis in 2020-2021. The FNG

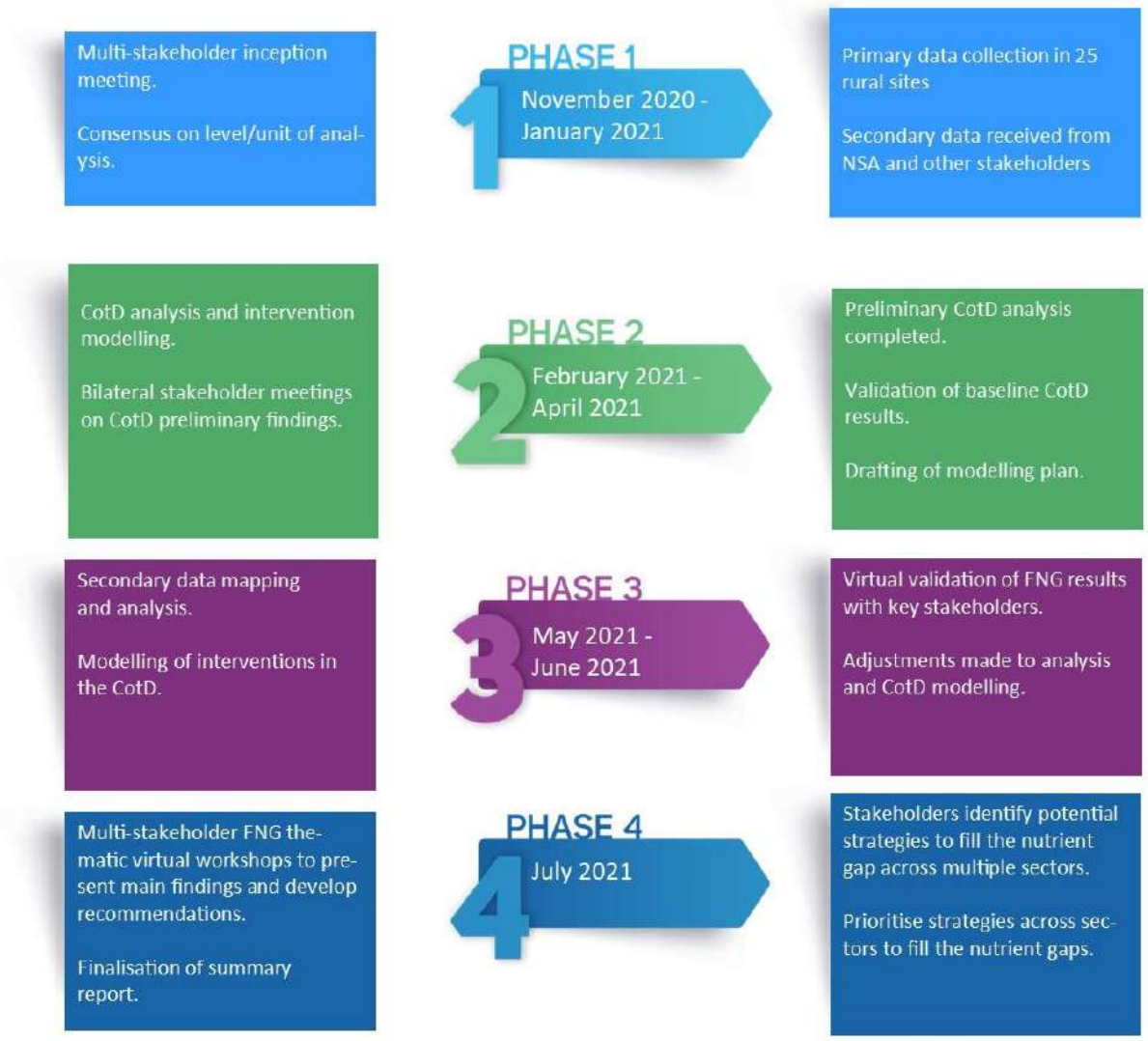
process brought together stakeholders from a variety of sectors, including health, agriculture, social protection, education and the private sector. It identified overlap and potential alignment across sectors for a strengthened nutrition response.

The FNG process was led by the National Planning Commission, under the Ministry of Planning; with the Office of the Prime Minister, the Ministry of Agriculture, Water and Land Reform and Ministry of Health and Social Services involved as key government stakeholders. Together with and through financial and technical support from GIZ and IFAD, the WFP FNG team served as the focal point for technical assistance on the analysis during the modelling of intervention, additional secondary data analysis and the practical implementation of the analysis' key recommendations.

Process of the FNG Analysis in Namibia

The process started in November 2020 with meetings between WFP, government, NGOs, UN agencies and other development partners. To define the focus, stakeholders established consensus on the analysis and identified ongoing and potential interventions for modelling. To complement existing data, primary market data was collected by GIZ and WFP in January 2021. The FNG team then conducted preliminary analysis and validated findings with stakeholders between February and April. Final technical revisions were completed in May and results were validated with key stakeholders in June. In July 2021, thematic workshops were held to develop sector specific recommendations. The final results will be presented to a wider stakeholder audience, followed by development recommendation workshops, which outline how to strategically, programmatically and policy-wise respond to the findings from the FNG.

Figure 1: The Fill the Nutrient Gap (FNG) process followed in Namibia

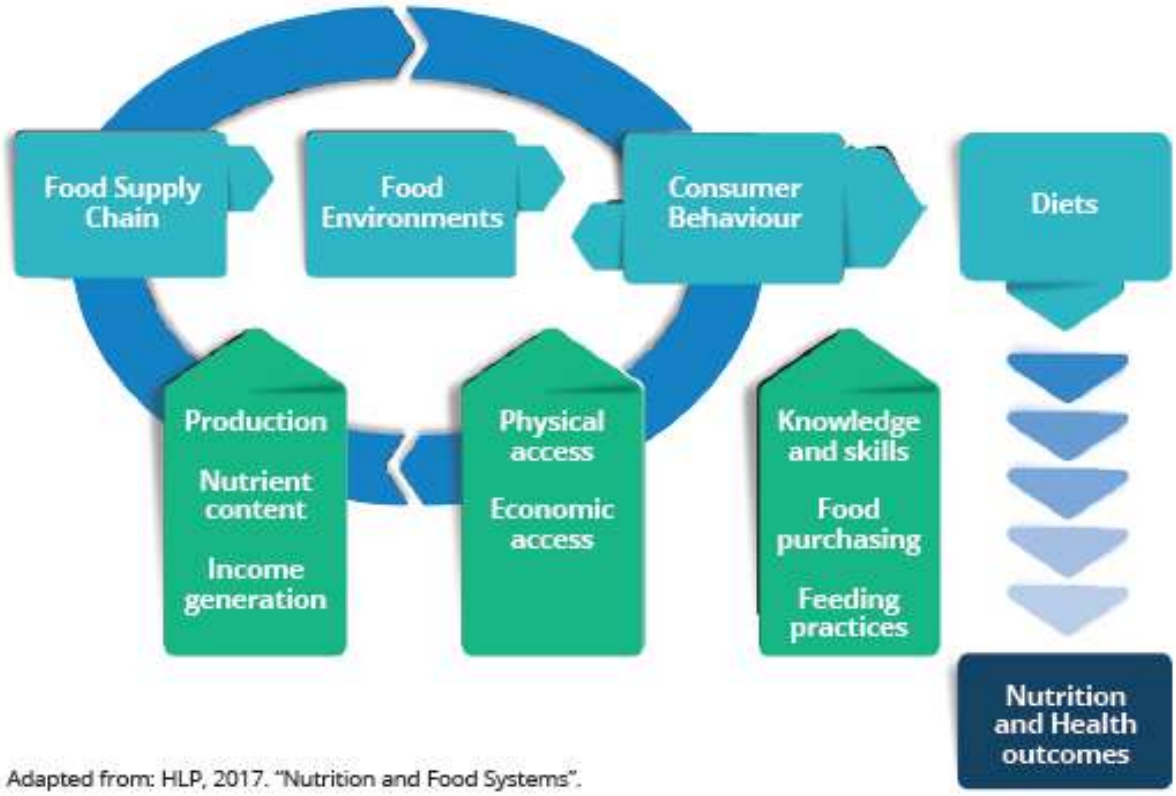


Scope and Focus of the FNG Analysis

In addition to informing ongoing policy and strategic processes, such as the development of the 6th National Development Plan, emphasis was placed on improved understanding of entry points for nutrition-sensitive agriculture, value chains as well as interventions targeting smallholder farmers (Main message 5). The nutritional vulnerability of people living with HIV was considered as a key issue in improving the lives of the Namibian population (Main message 8), as was food access and availability for marginalized groups (Main message 4) and vulnerabilities across the life cycle (Main message 6 and 7).

Long-term solutions to malnutrition require transformation of the food system along food supply chains, food environments and consumer behaviour patterns (**Error! Reference source not found.**2). Multi-sectoral modelling, reflecting the direction outlined by the Harambee Prosperity Plan II included entry points from sectors such as health, social protection, agriculture and education (Main message 11). The aim of this modelling is to show the incremental benefit that each sector contributes to transforming the local food system to be more nutrition-sensitive, equitable and supportive of healthy, nutritious diets, ultimately leading to improved nutrition and health outcomes.

Figure 1: Food systems for diets and nutrition and health outcomes framework.

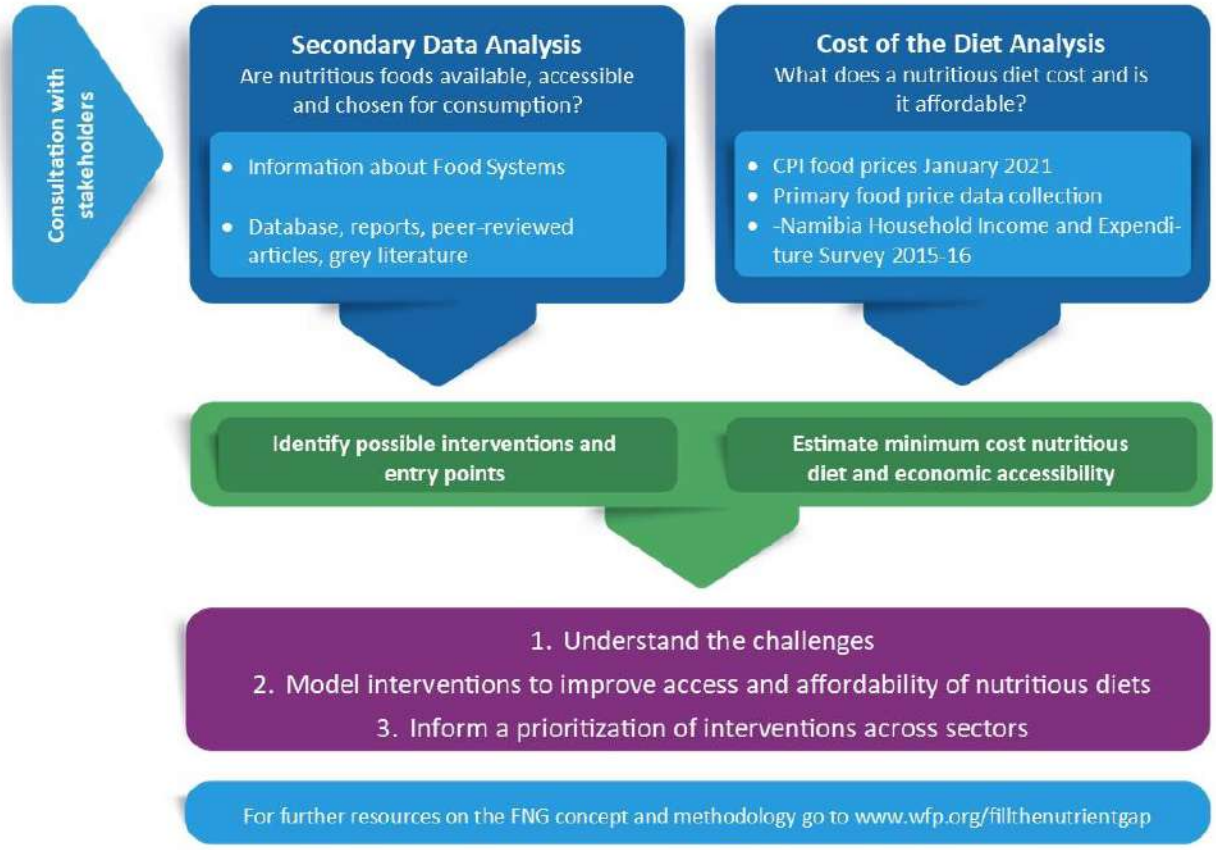


Adapted from: HLP, 2017. "Nutrition and Food Systems".

Methodology

The FNG analysis is composed of a secondary literature review of the food system and the social protection and health sectors, focusing on entry points for current and potential nutrition interventions, and a Cost of the Diet (CotD) analysis. CotD analysis uses linear optimization to provide a detailed look at availability, cost and affordability of nutritious diets (Figure 3).

Figure 3: FNG analytical framework.



Secondary Data Analysis

FNG secondary data analysis identifies barriers to accessing healthy diets, platforms for reaching nutritionally vulnerable groups in the population and opportunities for policy and programme interventions to improve access to nutritious foods through multiple sectors, including agriculture, health, social protection and education.

Cost of the Diet (CotD)

COST OF THE DIET (CotD) ANALYSIS

CotD software uses linear programming to understand the extent to which poverty, food availability and food prices may affect the ability of people to meet their nutrient needs. Using price data collected from markets or from secondary sources, the software calculates the amount, combination, and lowest possible cost of local foods that are required to provide individuals or households with their average needs for energy, and their recommended intake of protein, fat and

micronutrients[1]. These diets are calculated within defined constraints to prevent the inclusion of unrealistic types or amounts of food and the provision of excessive amounts of nutrients.

The FNG approach defines the 'Staple Adjusted Nutritious Diet' as the lowest cost nutritious diet that includes a typical staple food and excludes foods that are prohibited[2]. This diet is referred to as the 'nutritious diet' throughout this summary. It meets requirements for nutrients, including protein, nine vitamins and four minerals, and does not exceed energy and fat requirements. The nutritious diet is conceptually similar to the 'nutrient-adequate' diet estimated as the second level of diet quality in the State of Food Insecurity (SOFI) report.

Population expenditure data is compared to the cost of the nutritious diet and is used to estimate the proportion of the population that would not be able to afford it. This non-affordability can be estimated and compared across different regions, seasons or countries. The estimate of non-affordability is a conservative estimate of the share of households unable to afford the lowest cost nutritious diet, assuming optimized selection of nutritious foods. The real cost and non-affordability of a nutritious diet is likely to be higher, as reflected by a healthy diet, which includes foods from several food groups and has greater diversity within food groups.

[1]As defined by the Food and Agricultural Organization (FAO) and the World Health Organization (WHO).
[2]This diet is not intended to reflect what individuals or households are currently eating nor should it be used to develop food-based recommendations or dietary guidelines. Foods that are prohibited could be for customary or public health reasons, e.g., raw meat during pregnancy in some parts of the world.

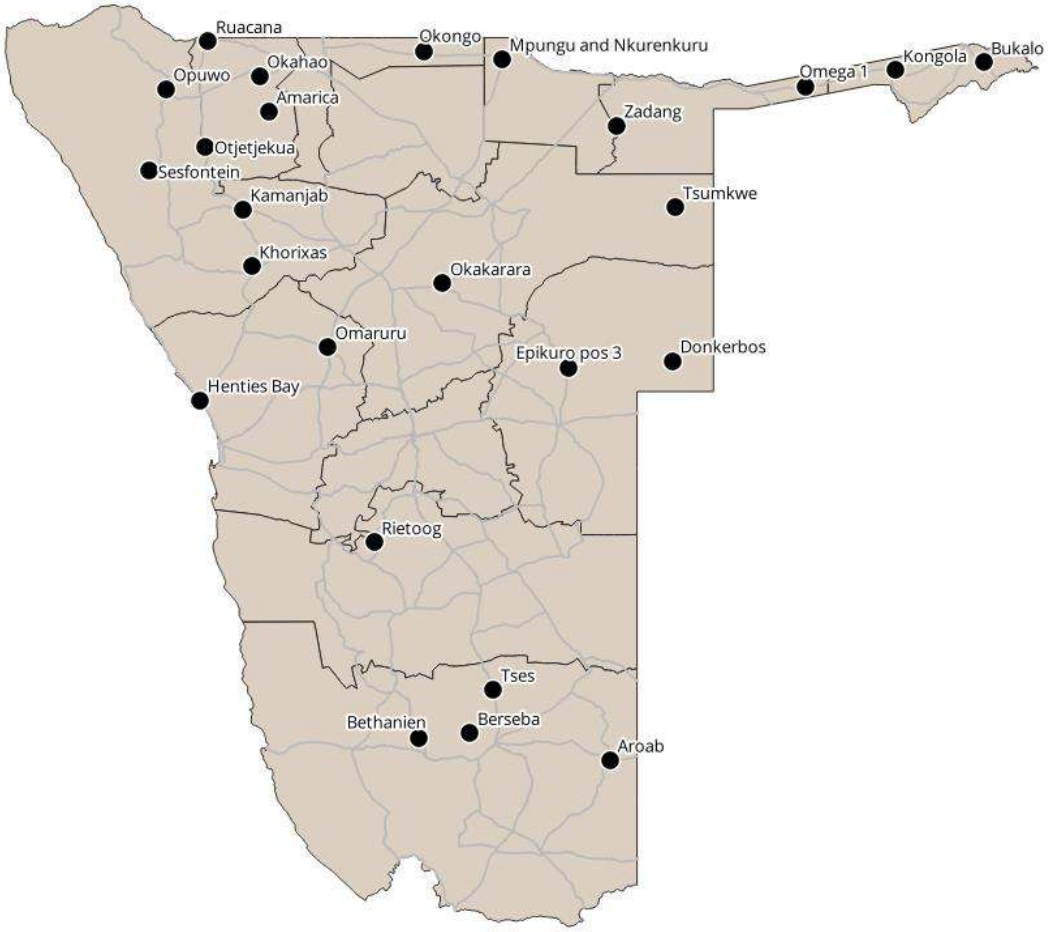
Data sources for CotD analysis

Food price data from January 2021, collected monthly by the Namibia Statistics Agency (NSA) to calculate the Consumer Price Index (CPI), were used as a basis for the cost of the diet calculations in this analysis. A cost of the diet was estimated for each of the eight cities where CPI price data is currently collected. Additionally, cost of the diet averages were calculated for the three CPI zones. In addition to these data, primary food price data were collected in January 2021 from twenty-five sites across Namibia (see Figure 4), to provide greater geographical coverage and greater insight into availability and prices of foods in more remote locations. The surveyed sites were identified through multi-stakeholder consultations (NSA, NPC, GIZ, IFAD and WFP) and guided by recent poverty assessments

and livelihood zone profiling information, thus based on non-probability, purposive sampling. The field survey was led by GIZ staff, supported by WFP staff and NSA enumerators. The month of January (2021) was also selected to better understand access to markets and food during the lean season.

Primary data were used to calculate cost of the diet estimates for each of the twenty-five sites. The data points were also grouped according to livelihood zone boundaries, according to the 2010 baseline profile conducted by the Office of the Prime Minister Directorate Disaster Risk Management.

Figure 4: Map showing locations from which primary data on food prices were collected



Modelled household & main target groups for the analysis

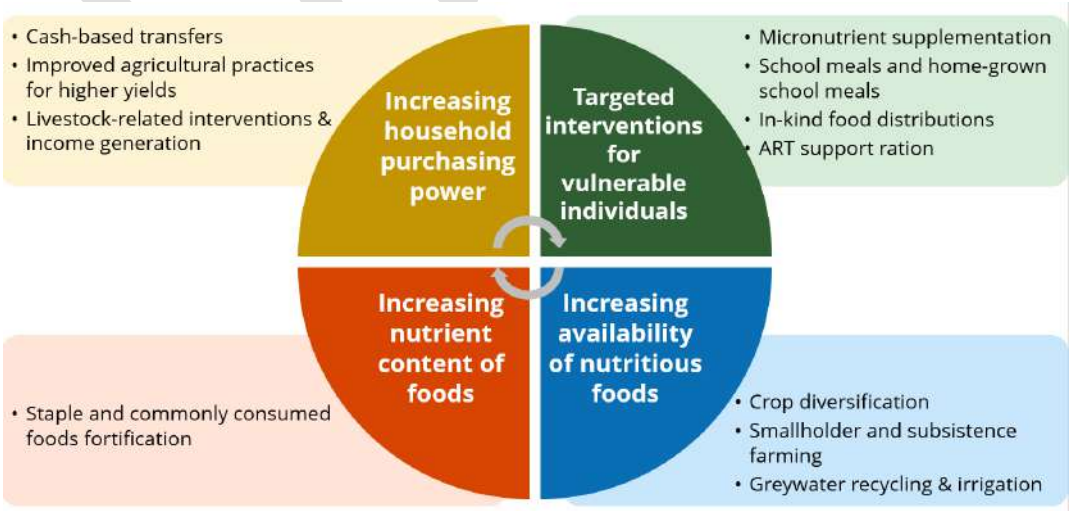
Diet costs were estimated for a FNG standard household of five members, selected to represent nutritionally vulnerable target groups in the population. As per the 2016 Demographic Health Survey, the average household size was 4.2 nationally (4.7 and 3.8 for rural and urban households, respectively). The household composition used for the analysis reflects different stages of life and nutrition needs and has been found to provide a good per capita average for the population as a whole. The household includes:

- breastfed child 6 - 24 months
- school-going child
- adolescent girl
- breastfeeding adult woman
- adult man.

Intervention modelling

Based on discussions with stakeholders all interventions modelled in the FNG analysis were defined and approved by stakeholders. The focus of the modelling was initially defined at the inception of the FNG, based on government priorities and further defined during the analytical process. The interventions modelled in this analysis were based on initiatives currently being implemented or planned by the Government of Namibia, WFP, NGOs, civil society, line ministries, and UN partners. Modelling of interventions was carried out based on available data. The potential impact of interventions was assessed on the CPI based estimates or the primary data-based estimates, depending on the intervention and relevance to the locality. To identify concrete recommendations based on analyses, the FNG process concentrated on modelling the interventions outlined in Figure 5.

Figure 5: Entry points and interventions modelled to estimate reduction in cost of a nutritious diet



Considerations for interpretation and data gaps

Expenditure data from 2016 (NHIES 2015-16) was used to inform the affordability analysis, as more recent nationally representative expenditure data is not currently available. Similarly, health indicators reported in this analysis were informed by the Namibia Demographic Health Survey (DHS) of 2013, as no other nationally representative demographic health survey has been conducted since.

Primary food price data collected in January 2021 and used in this analysis are not representative of rural access across Namibia, as this would have required a larger sample of markets, which was beyond the scope of this study. The estimates of cost and non-affordability for the individual primary sites should be interpreted as point estimates reflective of access to nutritious food at the surveyed location and potentially indicative of access for similar or neighbouring sites.

The estimates of the costs of the energy-only and nutritious diets reported here should be interpreted as a cost reflective of minimally viable diets, or as an economic benchmark based on what is available in markets during the period of January, thus a period of restricted availability and access. The diets should not be interpreted as desirable diets or diets reflective of actual or current consumption patterns. The cost reducing effect of the interventions modelled is reflective of the extent to which macro- and micronutrient specifications for individuals can be met by the foods at a lower cost, thus bringing nutritious diets closer to households' economic reach. Interventions modelled for the purpose of this analysis are a result of stakeholder consultations; however, the full extent of interventions being implemented in Namibia may not be captured in this analysis.

Findings

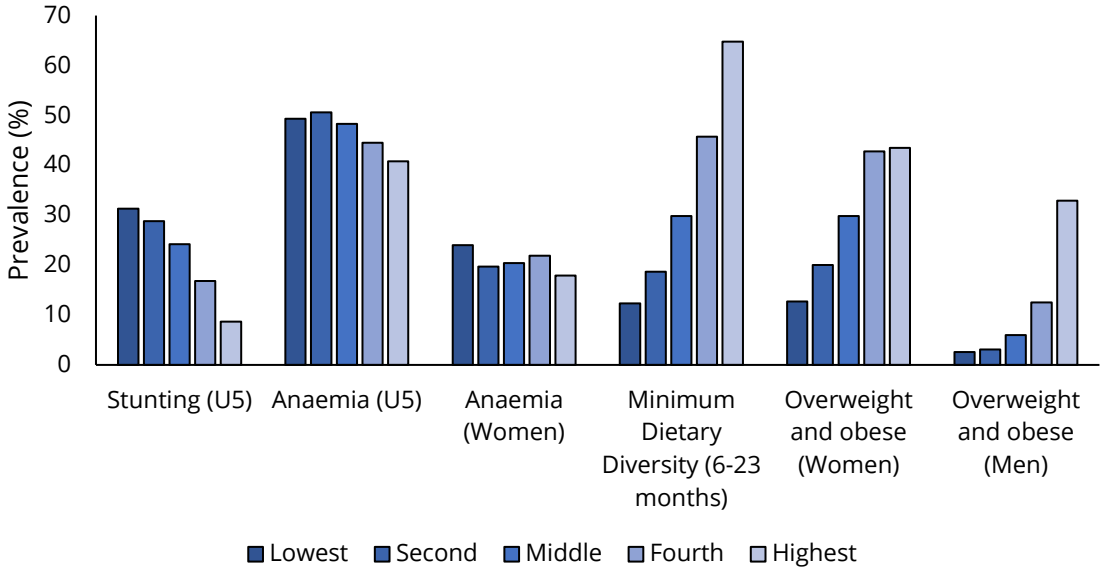
1. **PROGRESS HAS BEEN MADE IN IMPROVING PUBLIC HEALTH, BUT MORTALITY RELATED TO DIETARY CAUSES (INCLUDING HYPERTENSION, STROKE, DIABETES) ARE ON THE RISE. MALNUTRITION IS AN ISSUE THAT AFFECTS ALL WEALTH GROUPS.**

Despite tremendous progress in improving public health and reducing deaths from diseases such as HIV/AIDS, tuberculosis or diarrheal diseases, more people are dying from non-communicable diseases. These diseases, such as stroke, ischemic heart disease or diabetes are related to dietary intake and have increased both in relative (i.e. they are ranking higher than they used to) and absolute importance (i.e. they are causing more deaths than they used to).

At the same time there has been limited progress in reducing stunting and wasting since 2007, while overweight and obesity are on the rise. The cost of ignoring these trends are high: the annual loss in GDP associated with undernutrition is estimated to be as high as 6 percent, costing the country just below US$1 billion each year in earning potential – not yet accounting for the economic impact of overweight and obesity.

Malnutrition affects all wealth groups and is not limited to poorer parts of the population: Stunting is highest in the poorest wealth quintile, where the adequate dietary diversity for children between 6 and 23 months is lowest (12 percent). However, despite better dietary diversity for children under 2 in the wealthiest group (65 percent), anaemia in children under 5 and women is almost as high as in the poorest (41 percent compared to 49 percent for children under 5 and 18 percent compared to 24 for women of reproductive age). And wealthier quintiles are also more likely to be overweight and obese: Almost two out of five women and one in three men in the richest group are overweight and obese. These findings indicate that, independent of wealth, only few households in Namibia actually consume a healthy, nutritious diet and that the current food system is largely providing diets that are insufficient from a nutrition perspective.

Figure 6: Nutrition indicators by wealth group (DHS 2013).



2. THE NUTRITIOUS DIET COULD COST ON AVERAGE 103 NAMIBIAN DOLLARS FOR A FIVE-PERSON HOUSEHOLD PER DAY. IT CAN BE UP TO FOUR TIMES MORE EXPENSIVE TO MEET NUTRIENT REQUIREMENTS WITHIN NAMIBIA, DEPENDING ON LOCATION.

A nutritious diet, meeting the nutrient needs of a five-person household is estimated to cost at a minimum 99 Namibian dollars per household per day, whereas meeting energy needs would cost 31 Namibian dollars. Meeting nutrient needs is therefore up to three times as expensive than meeting energy needs for the same households. This is largely due to the different composition of the diet: whereas the energy only diet consists of basic staples, oil and sugar, a nutritious diet includes a number of fresh, nutritious foods to meet household needs: green leafy vegetables, fresh dairy products, meat, eggs and other animal sources, pulses as well as vegetables and fruits. Those foods that are providing essential micronutrients are more expensive and drive up the cost of the household.

In some cases, fresh, nutritious foods have low availability and markets are dominated by staples and dried foods. Comparing the estimates derived from the Consumer Price Index data with those from the primary market collection shows: the cost in rural areas have a wider range and can be more than two times as expensive than those in urban areas. Across rural sites the cost for a minimum cost nutritious diet varies from 62 up to 246

Namibian dollars per household per day. In some cases (Donkerbos and Zadang) it was not possible to calculate a nutritious diet, due to the lack of foods found at the market.[1]

Figure 7: Daily Household cost for Energy Only and Nutritious Diets in N$ by assessment market

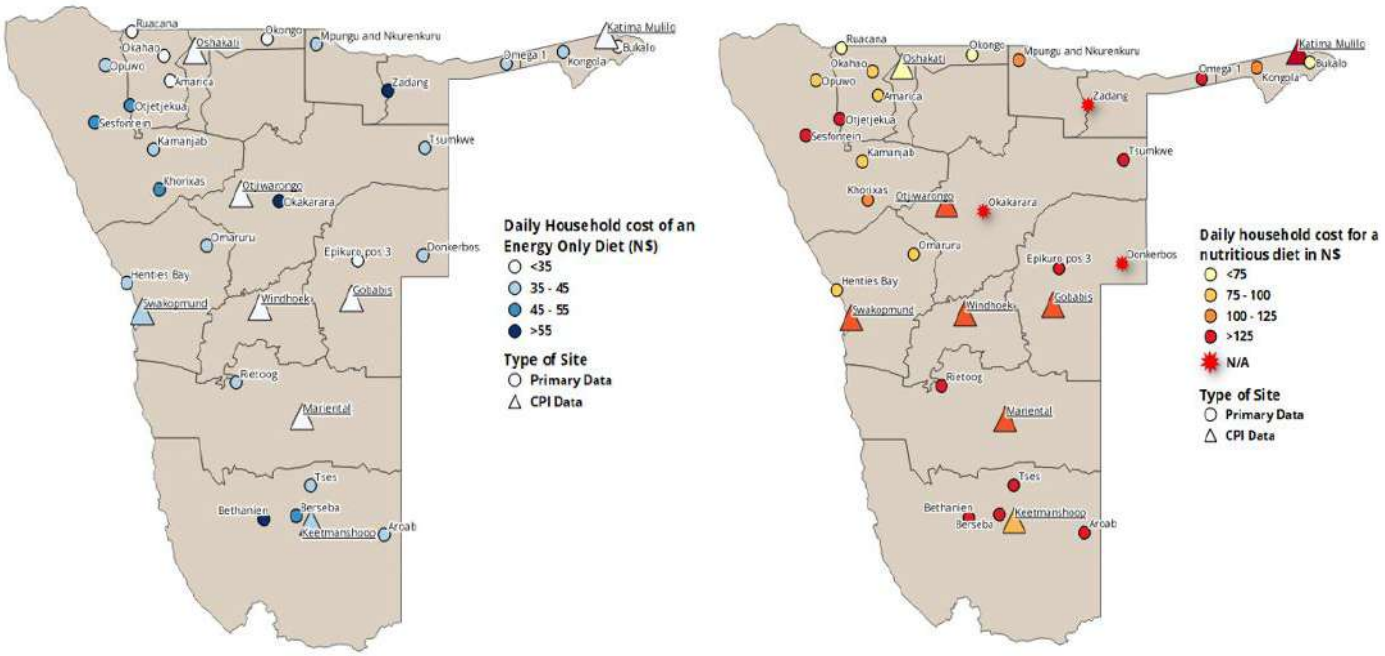


Figure 2 shows that the main urban hubs have lower cost compared to the more remote rural sites. They also show on average lower estimated cost for both energy only and nutritious diets. Using cost estimates to derive average cost by livelihood zones shows that meeting nutrient needs is more expensive in Southern communal small stock, Kunene cattle and small stock and Eastern communal cattle ranching livelihoods. Due to the nature of the data collection (one-off data collection and low number of markets) this pattern may shift over time, but is in line with existing evidence confirming the vulnerability of communal livestock livelihoods and smallholder farmers.

3. CURRENTLY, AT LEAST ONE IN THREE HOUSEHOLDS WOULD NOT BE ABLE TO AFFORD THE NUTRITIOUS DIET. RURAL HOUSEHOLDS ARE MOST AT RISK OF BEING UNABLE TO AFFORD THE DIET, WITH NON-AFFORDABILITY HIGHER THAN 70% IN CERTAIN PROVINCES.

On a national level (using only representative CPI and food expenditure data) almost one in ten households ()%) could not afford to meet their energy needs and over one in three

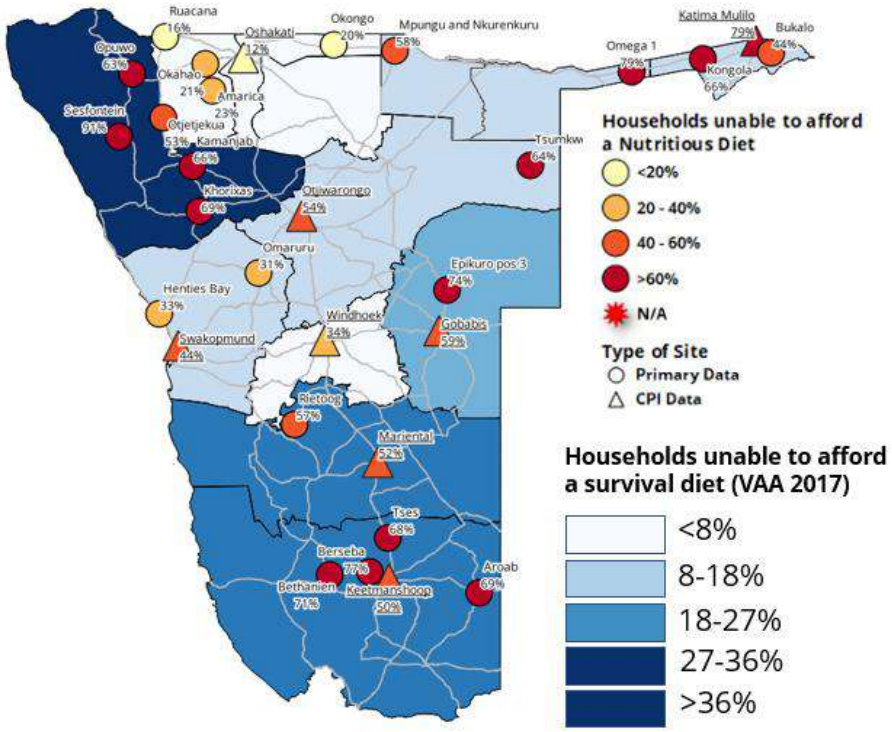
[1] A third site, Okakarara, also had insufficient number of foods to calculate a nutritious diet, however, this was most likely due to an error in data collection.

households (39%) would not be able not to meet their nutrient needs. These high numbers of non-affordability indicate a clear economic barrier to a nutritious diet: both those areas with lower average food expenditure and higher unemployment have higher levels of non-affordability. In other words: where resources are scarce households have to deprioritize nutritional needs over other essential requirements.

Those households that are missing money to buy a nutritious diet face a large gap: the poorest 40 percent are missing at least 454 Namibian dollars per month (or 26 percent of total cost) to meet their nutrient needs, whereas the poorest quintile (bottom 20 percent) are still 1,761 Namibian dollars (or 56 percent of total cost) away from being able to afford a nutritious diet. In some towns, such as Gobabis or Katima Mulilo, the poorest 30 percent are missing more than half of the total amount needed.

Just as with cost, non-affordability is distributed unevenly: Namibia's rural areas are far worse off, with non-affordability reaching higher than 70% in some areas (Sesfontein, Omega 1, Epikuro, Bethanien, Berseba). The location and severity of non-affordability is in line with recent vulnerability assessments: those places with higher non-affordability also show higher rates of vulnerability estimated in 2017 (Figure 3). It is therefore particularly the areas in the North-West (Kunene) and South (Hardap and Karas), where economic barriers during the lean season are peaking.

Figure 8: Comparison on non-affordability of a nutritious diet by market (CotD 2021) and non-affordability of a survival diet (VAA 2017)

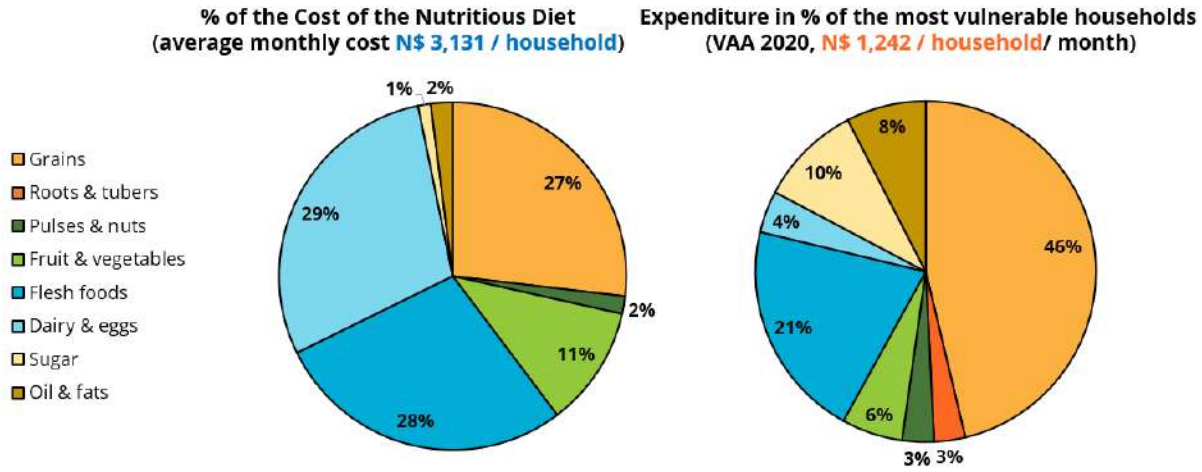


4. FRESH, NUTRITIOUS FOODS CONTRIBUTE THE MOST TOWARDS COVERING MICRONUTRIENT NEEDS AND MAKE UP THE BULK OF THE COST OF THE NUTRITIOUS DIET. CURRENT FOOD EXPENDITURE PATTERNS INDICATE THAT VULNERABLE HOUSEHOLDS ARE NOT CONSUMING SUFFICIENT QUANTITIES OF FRUITS AND VEGETABLES.

Fresh, nutritious foods, such as fish, meat and dairy, as well as fruit and vegetables, contribute the most to the total cost of the optimized nutritious diets calculated. Animal source foods contribute to the largest share (57%) of the total cost of the optimized diet, whereas vegetables and fruit contributed to a smaller share of the total (11%). Grains, such as maize or wheat, make up just over a quarter (27%) of total cost, although these contribute the most to overall dietary energy (70%) and over half (59%) of the total quantity of food. Nevertheless, animal source foods contribute the most to micronutrient attribution; meat, eggs and fish contribute to almost half (49%) of the total iron content.

Current food expenditure patterns indicate that households are not consuming sufficient quantities of fruits and vegetables (Figure 9). Based on the Vulnerability Assessment (2020) in Namibia, 1,242 Namibian dollars are spent on average on food each month; of these, 46 percent is spent on grains and cereals, however, this varies across regions (from 32 percent in Hardap and Otjozondjupa to 69 percent in Kavango East). Similarly to the optimized diet, 21 percent (versus 28% in the optimized diet) of the budget is allocated to flesh foods (meat and fish), yet, only 4 percent is spent on dairy and eggs. A considerable proportion of the budget (10%) is spent on sugar: 10 percent compared with 1 percent in the optimized diet. Nevertheless, the overall cost of the optimized nutritious diet is 2.5 times the average food budget of a Namibian household (N$ 3,131 compared with N$1,242).

Figure 9: Percentage contribution of food groups to the total cost of the optimized nutritious diet (left) and the average food expenditure (VAA 2020) in Namibia (right)



In Namibia, intakes of micronutrient-dense and protein-rich foods are generally below the World Health Organization (WHO) recommended levels: of the 400 grams of fruit and vegetables recommended by the WHO as daily intake per person, only 100 grams are consumed. Nevertheless, current availability of fruit and vegetable does not support these adequate levels of consumption, as only 158 grams per capita are available daily based on current estimates. A greater variety of foods that could contribute to a nutritious diet, including fruit and vegetables, are available in urban centres compared with rural sites; for example, 28 different meat products are available across the CPI locations compared with 4 found in rural sites surveyed. Similarly, 14 types of vegetables (or vegetable products) and 19 fruits (or fruit products) were available across CPI locations compared with 2 and 3, respectively, at more remote areas covered during data collection.

Most households in Namibia rely on market purchases (between 95 and 67 percent of food groups), as opposed to home production or in-kind donations. Nevertheless, there is a high degree of variation depending on locality. For example, the proportion of the meat consumed coming from in-kind donations or home production varies between 44 percent in Omusati (and similarly high in Kinene, Oshikoto, Ohangwena and Omaheke) to only 5 percent in Erongo. Up to 82 percent of vegetables are either produced at home or foraged in Oshikoto, followed by 52 percent in Ohangwena, 44 percent in Kavango West, 39 percent in Zambezi and 34 percent in Omusati; in regions such as Hardap, Khmas and Erongo, this varies between 3 and 0 percent, reflecting the impact of relative rainfall and climate when it comes to home production and wild food collection.

5. ALTHOUGH MOST HOUSEHOLDS LIVE AT LEAST PARTLY OFF AGRICULTURE, THE AGRICULTURAL SECTOR CONTRIBUTES ONLY TO A SMALL FRACTION OF GDP. NUTRIENT-DENSE FOODS ARE NOT WIDELY PRODUCED, AND MAIN DOMESTIC SUPPLY ARE STAPLES.

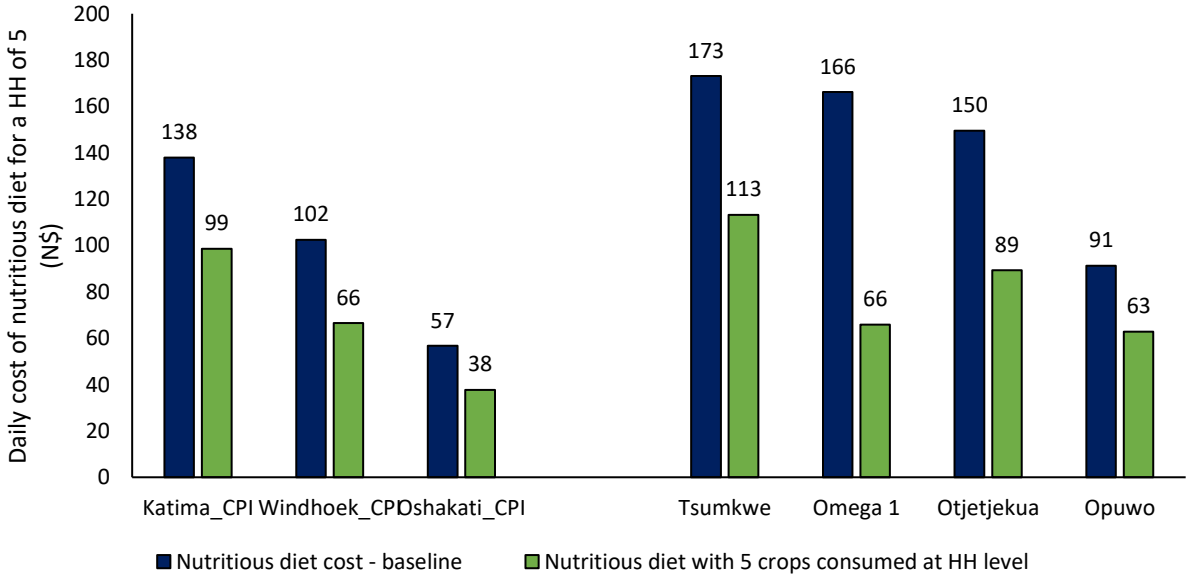
Almost one in four Namibians (23%) is employed in the agriculture, forestry, and fishing sector, which accounts for 7.1% of the country's gross domestic product (GDP). The agriculture sector has a direct and indirect impact on the livelihoods of 70% of Namibians, which includes 48% of rural households that depend on subsistence agriculture. Yet, Agriculture's contribution to GDP has marginally decreased over the last decade, relatively and absolutely, from 8.6% in 2010 to 7.1% of GDP in 2019, and from 967 million US dollars in 2010 to 888 million US dollars in 2019.

Exports are dominated by high-value products, such as cattle and sheet/goat, whilst up to one third of total availability for vegetables, fruits and meats is exported. Although the availability of fresh vegetables and fruits has marginally increased from 2000 to 2018, supply has more recently been decreasing. Severe drought conditions experienced across

the country in 2019 have further inhibited agricultural productivity, which has likely led to a further decrease of general production. For some micronutrients, such as vitamin A and folate, current domestic production is below population based nutrient adequacy levels.

Namibia experiences a high degree of climate variability, such as droughts, variable rainfall patterns and temperature increases, and it is among the countries expected to suffer from the effects of climate change. Innovation in water management systems is central to Namibia's Climate Change Strategy, especially considering that only 2% of land in Namibia receives sufficient rainfall for crop production. Initiatives such as the Green Scheme, which aim to increase productivity through investment in irrigation systems, has great potential to increase the supply of fresh produce. CotD modelling was used to estimate the impact of increased horticultural production through greywater use and irrigation filtering system, and potential increase in home consumption of these products. Figure 10 shows the cost reduction of a household of five consuming production surplus. Reduction in the cost of the diet varied between 28 (in Katima) and 60 percent (in Omega 1). Unsurprisingly, the reduction in cost was greater in more rural areas, where availability of diverse food products is lower compared to urban centres. Although this type of intervention shows great potential for increasing productivity and, potentially, consumption of fresh produce, 9.1 percent of vegetable production, 4.7 percent of fruit and 4.2 percent of pulses is lost during the post-harvesting phase – tackling this issue would be crucial in ensuring further impact of these interventions.

Figure 10: Consumption of home-grown crops (cabbage, carrots, onions, butternut and tomatoes)[2] and the potential effect in reducing the cost of the diet



[2] Daily amounts: 4.1 kg of tomatoes, 1.3kg of onions, 3.6kg of cabbage, 1.6kg of butternut squash, 1.1kg of carrots.

The potential impact of an indigenous chicken project, aiming to increase production and, thus, availability of chicken eggs and meat, was also modelled using CotD. Based on a small-medium scale production (50 hens, 50 roosters), the potential impact of consumption of five eggs per individual (weekly) and a chicken per household of five (fortnight) was modelled, which resulted in a reduction in the cost of nutritious diet between 6 and 14 percent. Although the reduction in cost is relatively modest, consumption could also be improved by the potential revenue of the sale of roosters and eggs, estimated at approximately 740 Namibian dollars.

Although the extent of foraging and hunting in Namibia are not well documented, consumption of wild foods is common in some parts of the country. Examples of these are mopane worms, jackal berries, bird plums, and various green leafy vegetables (e.g. *ombidi* and *omutete*). Modelling using CotD software showed that consuming small quantities of foraged (or home grown) green leafy vegetables or mopane worms could make nutritious diets more accessible. The impact of up to 100g of green leafy vegetables per person, daily, could reduce the cost of a nutritious diet between 12 and 19 percent (depending on locality and baseline cost). A small portion (40g) of mopane worms, daily, revealed a potential to decrease the cost between 16 and 46 percent.

In addition to diversified diets, micronutrient intake could also be improved through large-scale fortification initiatives, such as fortifying maize or wheat-based products. Modelling in the cost of the diet showed that replacing non-enriched maize flour with fortified maize flour could lead to a reduction in the cost of the diet between 3 and 17 percent. Increasing access to nutrients is especially crucial for households with limited purchasing power (see Main Message 2 for non-affordability estimates); legislation for mandatory fortification of staple products could increase access to nutritious diets, especially for vulnerable households.

6. BREASTFEEDING PRACTICES ARE SUBOPTIMAL, EXCLUSIVE BREASTFEEDING RATES ARE BELOW GLOBAL TARGETS. DIETARY DIVERSITY IS LOW AND ASSOCIATED WITH THE AMOUNT OF HOUSEHOLD BUDGET SPENT ON FOOD.

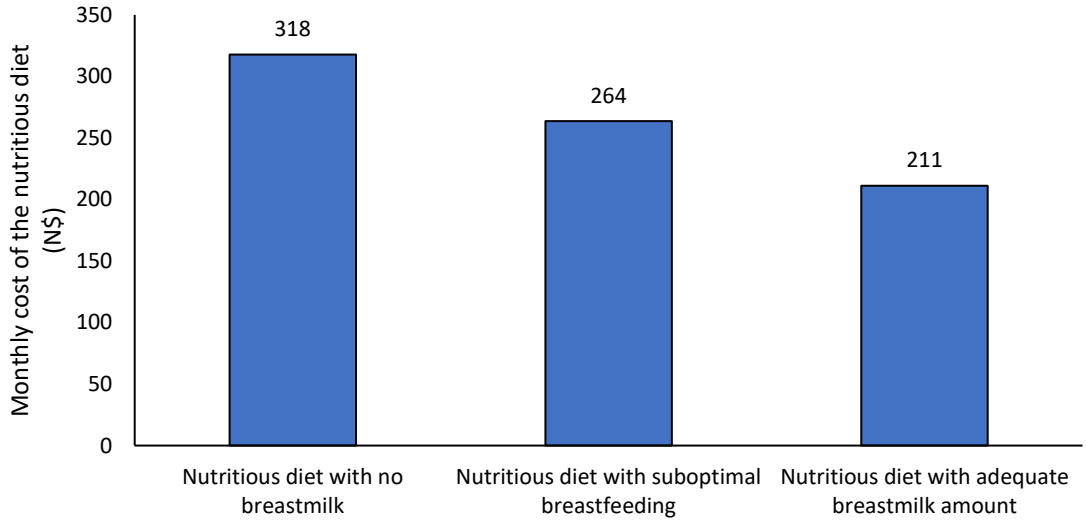
In Namibia, rates of exclusive breastfeeding fall short of meeting the World Health Organisation (WHO) target of 50 percent (49%), with an average exclusive breastfeeding duration of 3.5 months. Complementary feeding practices are also suboptimal: although 80 percent of children are introduced to solid and semi-solid foods at 6-8 months, only 9 percent of these consume a minimum acceptable diet. Stunting prevalence also increases as children start to consume solid and semi-solid foods (between 6-8 and 9-11 months).

The nutritional value of breastmilk is significant and ensuring that a child's diet is nutritionally adequate can be a greater challenge in absence of adequate breastfeeding.

Modelling in the CotD software showed that a nutritious diet without appropriate breastmilk consumption during the complementary breastfeeding period (6 to 23 months) would cost 34 percent more than a diet with age appropriate consumption of breastmilk (Figure 11).

Approximately one in eight children aged 6 to 23 months is consuming an adequate diet (Minimum Acceptable Diet) in Namibia, with 31 percent of children meeting minimum dietary diversity and 41 percent meeting minimum frequency. Diets of infants and young children would need to include significantly more fruit and vegetables, legumes, and animal source foods, as well as increase in frequency, to sustain requirements for adequate cognitive development and growth. Households that spend a larger amount of their income on food, which is typical of lower income families, showed a lower percentage of children with adequate dietary diversity, highlighting economic access as an important constraint.

Figure 11: Cost of a nutritious diet for 12 - 23 month-old infants and young children, without breastmilk, with suboptimal (50% recommended quantity) and optimal breastmilk content (39% of energy requirements, as recommended by Dewey and Brown).

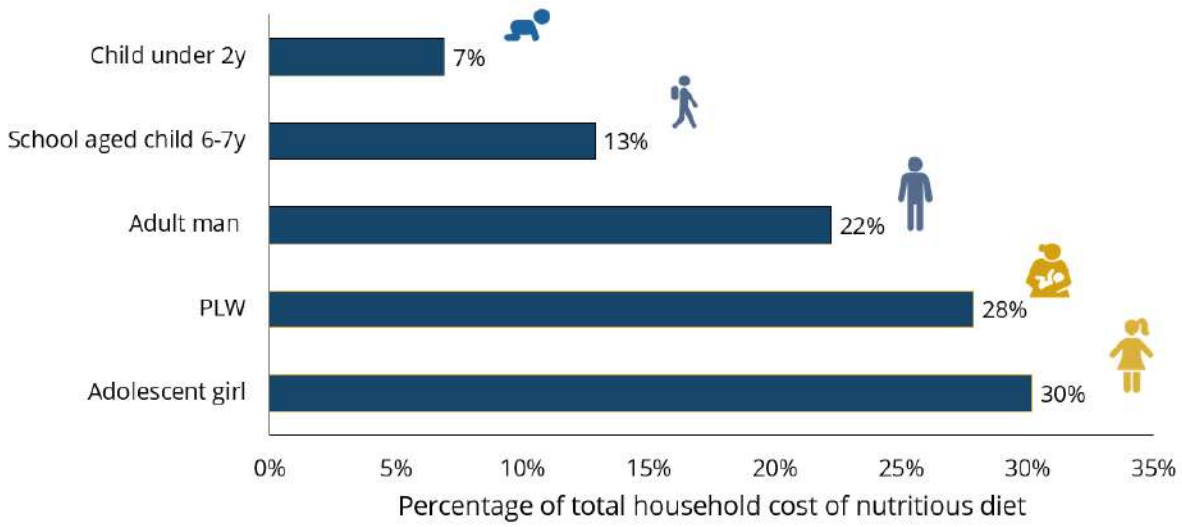


7. THE ADOLESCENT GIRL AND BREASTFEEDING WOMAN HAVE THE HIGHEST COST OF A NUTRITIOUS DIET AND FACE A HIGHER RISK OF NOT MEETING THEIR MICRONUTRIENT NEEDS. TARGETED NUTRITION SPECIFIC INTERVENTIONS COULD HELP MEET THESE HIGHER NUTRIENT NEEDS.

The cost of nutritious diets estimated was highest for adolescent girls and pregnant and lactating women: children under 2 represented 7 percent of the total cost of the diet, followed by the school-aged children (13%), adult men (22%), breastfeeding women (28%), and adolescent girls (30%) (Figure 12). This is unsurprising, as across FNG country analyses the estimated cost is highest for these two individuals, driven by their higher micronutrient

requirements compared to other individuals in the household. During adolescence and breastfeeding, for example, women require twice as much iron per kilocalorie than an adult man or a school-aged child, meaning that these individuals require more micronutrient-dense diets. Examples of micronutrient-rich foods are animal-source foods, such as meat, fish, eggs or dairy, which are often sold at a higher cost compared to other food items, such as cereals or roots and tubers.

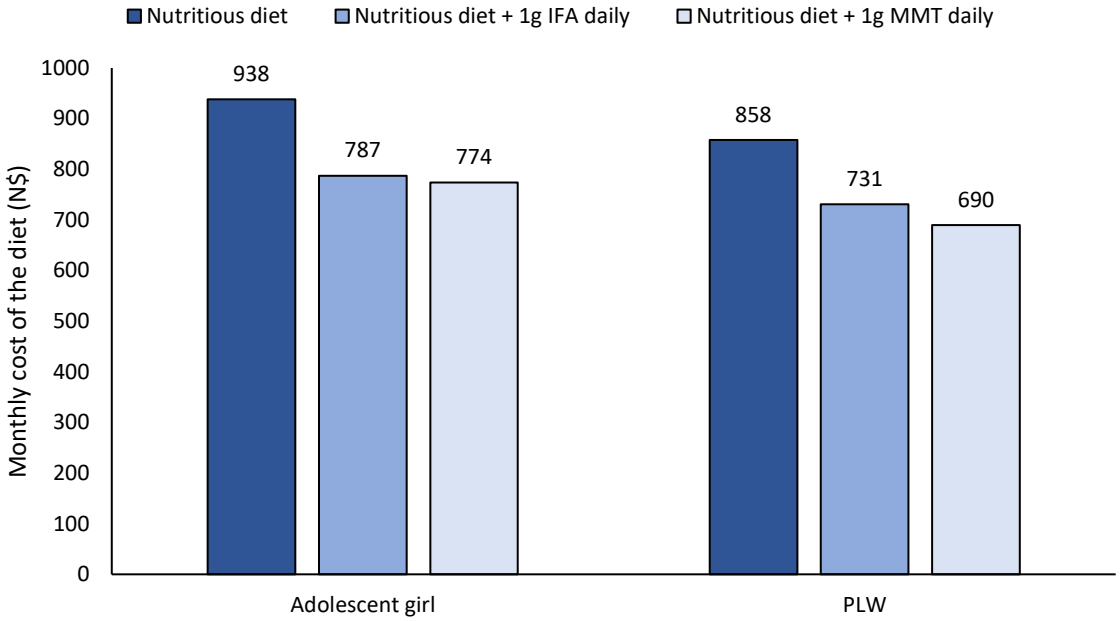
Figure 12: Proportion of total cost (%) per household member (average across CPI assessments)



The analysis revealed that meeting the requirements for calcium and vitamin C were mainly contributing to the high cost of the diet, but for adolescent girls and pregnant and lactating women, iron and calcium were the key drivers of cost, meaning they are at higher risk of not meeting these requirements.

In Namibia, 21 percent of women of reproductive age (WRA) are affected by anaemia and is as high as 33 percent in regions such as Kavango (DHS 2013). The potential impact of iron and folic acid (IFA) supplements and multiple micronutrient tablets (MMT) on the cost of the diet for pregnant and lactating women and adolescent girls was modelled in the CotD software (Figure 13). For pregnant and lactating women, the cost of a nutritious diet could be reduced by 15 percent if daily IFA were provided and 20 percent if daily MMT were provided (on average). For adolescent girls, the same daily amount of IFA could reduce the cost of nutritious diets by an average of 16 percent compared to 18 percent for MMT. In this model, it was assumed that these supplements could be provided through health services at zero cost to these individuals, thus, the feasibility of procuring and distributing supplements, such as MMT, would require further investigation.

Figure 13: Estimated impact on the cost of a nutritious diet if iron and folic acid supplements or multiple micronutrient tablets are provided (at zero cost) to pregnant and lactating women and adolescent girls



Namibian women also face a higher risk of overweight and obesity compared to men, with 32% of WRA classified as either overweight or obese, ranking above regional averages. Urbanisation is on the rise, as is the consumption of processed and convenience food: student health surveys found that among adolescents, 49 percent consumed a fast-food meal at least once a week, and 47 percent consumed at least one daily carbonated soft drink. The impact of the consumption of processed foods, such as carbonated soft drinks and potato chips, on the cost of nutritious diets was modelled using the CotD software. The results showed that a small daily portion (25g) of potato crisps could increase the cost of the diet by 7 percent for adolescent girls and PLW or up to 12 percent if one can of soda (330g) is consumed daily. For younger school-aged children, the cost of the diet could increase by 23 percent if a carbonated soft drink (330g) is consumed daily. The higher costs highlight the potential increase in the risk of not meeting nutrient requirements and/or excessive intake of energy (kilocalories) when processed, energy-dense and micronutrient poor foods are consumed.

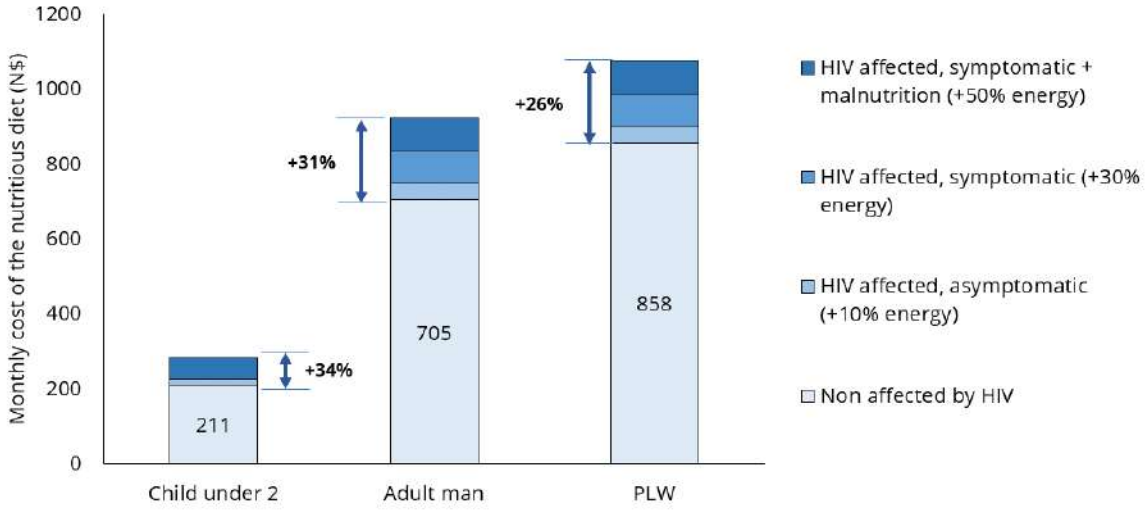
8. PREVALENCE OF HIV/AIDS IS HIGHER IN AREAS WITH COMPARABLY LOWER FOOD COST. BUT LIVING WITH HIV/AIDS INCREASES COST SIGNIFICANTLY. PEOPLE LIVING WITH HIV IN RURAL, REMOTE AREAS ARE THEREFORE VERY LIKELY TO NOT REGULARLY CONSUME A HEALTHY, NUTRITIOUS DIET.

Despite seeing progress over the last decade, Namibia remains among the countries with the highest prevalence of HIV/AIDS: 14 percent of adults aged 15 to 49 years is HIV positive, with prevalence as high as 24 percent in the region of Zambezi. Women are disproportionally affected by HIV: 17 percent of women and 11 percent of men (15-49 years) are HIV positive, showing the need to include more gender-sensitive targeting mechanisms. HIV/AIDS prevalence is also higher in more densely populated provinces and among rural residents. Areas with a high HIV prevalence spend relatively more of their food budget on cereals, although the cost of the diet was found to be lowest in some of these areas.

People living with HIV can have up to 50 percent higher requirements for energy intake and up to 100 percent in children, depending on symptoms and whether they are experiencing weight loss, too. The cost of nutritious diet is higher for people affected by HIV and is likely to increase with severity of symptoms. The cost was recalculated for a child under two years, an adult man and a PLW to account for increased energy requirements. For a child under 2, the cost of the diet could be up to 34 percent higher, up to 31percent higher for an adult man and up to 26 percent for a PLW. Based on average expenditure in the region of Zambezi, the affordability gap for HIV affected households could be up to 19 percent higher than a household that is not affected by HIV. Therefore, access to nutritious diets could be a greater challenge for households living with HIV.

Antiretroviral therapy (ART) support, in the form of an in-kind ration, is provided to vulnerable households affected by HIV and undergoing treatment for HIV. The impact of the ration, which include maize meal, split peas and vegetable oil, was modelled in the CotD and results showed that the cost of the nutritious diet could be decreased by 20 percent, on average. Therefore, ART support could help increase access to nutritious diets for vulnerable households, yet, a considerable gap remains.

Figure 14: The cost of the nutritious diet and additional cost increased energy requirements as a consequence of HIV infection, for a child 12 to 23 months, adult man and a PLW



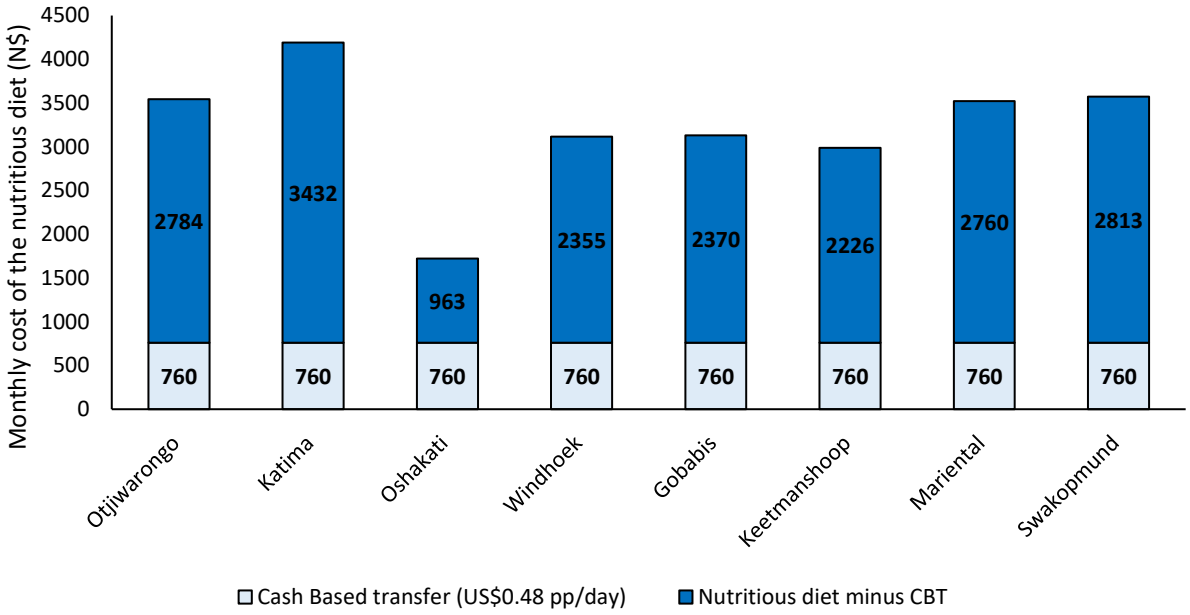
9. **POVERTY IS A MAIN DRIVER BEHIND INSUFFICIENT AND UNBALANCED, UNHEALTHY DIETARY INTAKE. THE SOCIAL PROTECTION FLOOR AND SOCIAL SAFETY NET FRAMEWORK CAN REDUCE THE ECONOMIC BURDEN TO HOUSEHOLDS. BETTER TARGETED SAFETY NETS COULD IMPROVE ACCESS TO NUTRITIOUS DIETS OF VULNERABLE GROUPS.**

The FNG analysis has identified affordability as a key barrier to adequate dietary intake. Supporting the economically vulnerable is important, as wealth status is closely associated with dietary diversity of young children (cf. Main Message 1). The same trend is visible in the impact of main source of income on children's nutrition: those parts of the country where subsistence farming is more common also have lower percentage of children with adequate dietary diversity. To break the intergenerational cycle of malnutrition, it is critical to support those households that currently cannot provide all family members with the appropriate foods.

Social Safety Net Frameworks and the Social Protection Floor are established concepts in Namibia for support to elderly, disabled, veterans as well as mothers and children. Cash transfers can be as high as 2200 Namibian dollars for disabled persons per month, but most nutritionally vulnerable individuals such as women and children would only receive up to 250 Namibian dollars per person per month. This leaves considerable gaps for the poorest: If 70 percent of the cash transfer is added to the average food expenditure of the lowest 20 percent of households, they are still missing around 1,000 Namibian dollars per month to afford a nutritious diet. In addition, transfer amounts go further in some regions compared to others: Whereas a cash based transfer of 760 Namibian dollars per month

covers more than half of the household cost in Oshakati, it is less than a quarter in Katima Mulilo and about one third of total cost in Mariental and Swakopmund. It is therefore important to reflect local price levels when setting transfer amounts.

Fig 15: Remaining cost to buy a nutritious diet after receiving a cash-based transfer transfer (70% of amount to go toward food expenditure) by CPI site (CotD 2021)



Social Safety Nets such as General Food Distribution improve the access to a nutritious diet, however, there remain considerable gaps in being able to afford a nutritious diet after the transfer. A monthly ration for a household of five, consisting of 58.2 kg maize meal, 9.1 kg split peas, 3.2 kg vegetable oil and 0.76 kg of iodized salt would reduce cost on average around 872 Namibian dollars. However, the remaining cost differ again between the regions, with the gap being particularly high in Katima Mulilo, Mariental, Otjiwarongo and Swakopmund. In addition to adjusting the transfer amounts, changing the ration composition or complementing it with fresh food vouchers could improve micronutrient intake and improve the economic burden of a nutritious diet at the household level

10. ENROLMENT RATES DROP AROUND UPPER SECONDARY, WHICH IS A CRITICAL TIME FOR NUTRITION. NUTRITIOUS AND DIVERSE SCHOOL MEALS COULD INCENTIVIZE ATTENDANCE AND CONTRIBUTE TO IMPROVED DIETARY INTAKE.

Education in Namibia is mandatory and universal, however, enrolment starts to reduce around grade 5 and drastically drops after grade 9. This trend is visible for both sexes and no differences are visible between boys and girls in current enrolment. Little systematic information is collected on the reasons for dropping out, but it is likely correlated with

economic and social push and pull factors. These include the need to look for a job, household chores or early marriage. If enrolment is indeed lower in poorer wealth groups, the lack of education can be an exacerbating factor to poorer individual development. Although not fully explored, prevalence of adults with no education is higher in poorer regions and more remote areas, such as Kunene, supporting the assumption that educational attainment is lower in poorer areas.

To estimate the impact of different school feeding programmes, the FNG in Namibia modelled three different types of school meals: a basic school meal consisting of a maize-soy blend porridge, and two pilot school meals adding diversified, fresh foods to the porridge. Each of the pilot school meals included at least two fresh food groups from fruits, vegetables or animal source foods (for full technical specifications please refer to the annotated slide deck). Assuming in-kind provision (i.e. the costs are borne by the programming agency) the models showed a reduction in cost for all age groups, ranging from 23 percent to 12 percent for the most effective model.

Utilizing education in general and school meals in particular can therefore serve as a unique platform to create incentives for improved attendance of children and adolescents. At the same time diversified school meals can improve dietary intake and potentially support local production if meals are homegrown and sourced from nearby farmers or homestead production. Global evidence also shows that improved diversity of diets can promote life-long healthier eating habits and generate awareness of the importance of a nutritious diet. In addition to helping children and adolescents eat healthier, this can also have carry-over effects onto their future children.

11. COMBINING INTERVENTIONS FROM MULTIPLE SECTORS COULD HAVE SIGNIFICANT EFFECT IN REDUCING THE COST OF THE NUTRITIOUS DIET FOR HOUSEHOLDS. IMPROVED TARGETING OF INTERVENTIONS AND GREATER EMPLOYMENT OPPORTUNITIES SO TO INCREASE PURCHASING POWER COULD MAKE NUTRITIOUS DIETS MORE ACCESSIBLE.

The Harambe Prosperity Plan II outlines distinct development goals for Namibia. Nutrition is cross-cutting in several of those, particularly relating to the Goal for Zero Deaths and Improved Access to Social Healthcare. Activities outlined under these goals are multisectoral and require coordinated efforts from all sectors to move the needle on malnutrition. To estimate the impact of multi-sectoral efforts on the barriers to adequate nutrient intake, the FNG models a number of interventions, ranging from different government sectors to NGOs or private sector initiatives.

No single intervention is able to eliminate the household burden by itself – there are no silver bullets when it comes to nutrition. Still, combining interventions shows great

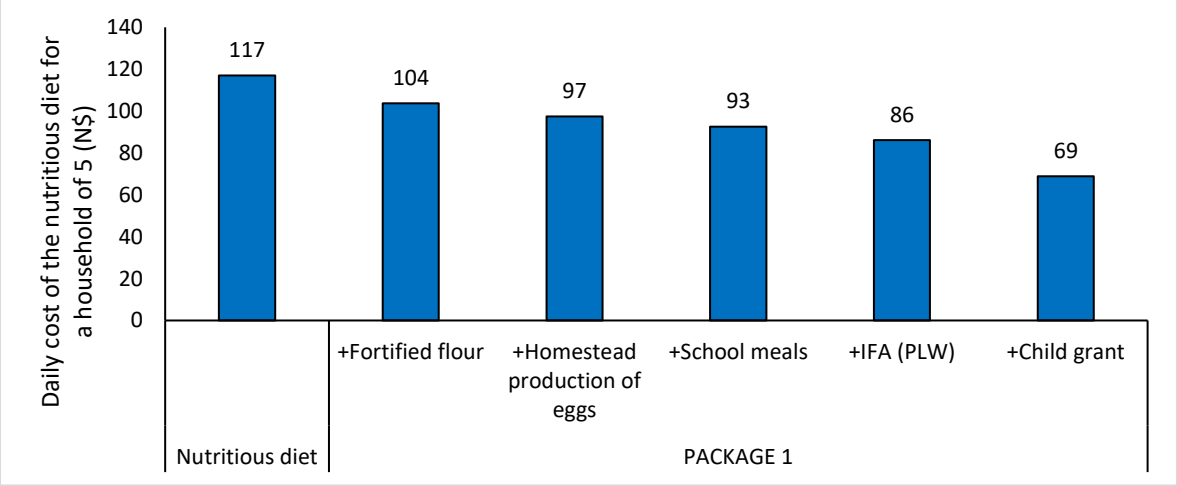
potential to reduce the cost to the household. Following the strategies outlined by the HPP II, the FNG in Namibia modelled a multi-sectoral household package to estimate the cost reduction of integrated programming of multiple interventions (Table 1). Leveraging the incremental contribution of each intervention yields a notable difference when combined across all actors.

Table 1: Interventions combined into a household package by target group

Target Group	Household Package
Child under 2 years	Optimal Breastfeeding Child Grant (250 N$)
School-Aged Children	School Meal Child Grant (250 N$)
Adolescent Girl	School Meal Child Grant (250 N$)
Breastfeeding Mother	Iron and Folic Acid Supplementation
All Household Members	Fortified Flour Homestead Production of Eggs

Including this household package for the modelling towns of Katima, Oshakati and Otjiwarongo shows a monthly reduction of around 1,704 Namibian dollars per household. With such a decrease in cost, it is estimated that non-affordability in those areas will be reduced by around 15 percentage points, drastically reducing existing barriers to a nutritious diet.

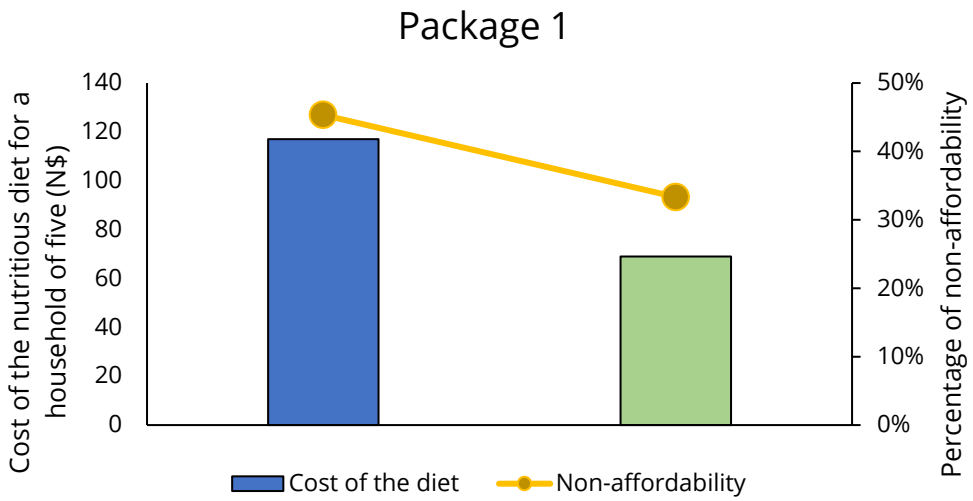
Figure 16: Incremental cost reduction by intervention (adding intervention from left to right)



These results demonstrate the possible effects that could be gained from increasing household's access to nutritious foods with a package of interventions delivered across

multiple entry points and sectors. The FNG also shows that the drivers of malnutrition require concerted efforts through all sectors and entry points. Line ministries, humanitarian actors and development partners must consider scaling-up short- and long-term nutrition interventions. By continuing to scale-up and combine incremental efforts through targeted and coordinated action, the vision of a healthy, nutritious diet being available, accessible, and affordable to all Namibian households is achievable.

Figure 17: Multi-sectoral household intervention package and the respective reduction in cost and non-affordability of a nutritious diet (selected regions only) (CotD 2021)



Recommendations / Stakeholder recommended priorities

To be added here after the recommendations development workshops on the 27th and 28th of July

Acronyms

ART	Antiretroviral Therapy
BCC	Behaviour Change Communication
CotD	Cost of the Diet
CPI	Consumer Price Index
DHS	Demographic Health Survey
FEWS NET	Famine Early Warning Systems Network
GDP	Gross Domestic Product
GHG	Greenhouse gases
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HCES	Household Consumption and Expenditure Survey
HIV/AIDS	Human Immunodeficiency Virus / Acquired Immunodeficiency Syndrome
IFA	Iron and folic acid (supplements)
IFAD	International Fund for Agricultural Development
MMT	Multiple micronutrient tablets
NCD	Non-communicable diseases
NSA	Namibia Statistics Agency
NPC	National Planning Commision
PLW	Pregnant and lactating women
SBCC	Social and Behaviour Change Communication
UN	United Nations
UNICEF	United Nations Children's Fund
USD	United States Dollar
WFP	United Nations World Food Programme
WHO	World Health Organization
WRA	Women of Reproductive Age

Contributors

To be inserted in final version