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Fill the Nutrient Gap Myanmar

SUMMARY REPORT



World Food
Programme



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Fill the Nutrient Gap Myanmar | SUMMARY REPORT

Improving nutrition for a healthy, productive Myanmar

Addressing malnutrition in all its forms is crucial for Myanmar to become a healthy, modern and productive nation. Good nutrition enhances physical and cognitive development, prevents disease and increases productivity. Despite macroeconomic growth and poverty reduction over the past decade, more than one in four children under five are stunted, 7 percent of children are wasted and nearly half of women of reproductive age suffer from anaemia. The annual loss in GDP associated with inadequate nutrition is estimated to be as high as 11 percent, costing the country more than US\$7 billion each year in earning potential.

Investments in evidence-based nutrition interventions can generate significant economic returns, ranging from US\$16 to as high as US\$35 for every dollar spent. The 2013 Lancet series on maternal and child undernutrition identified a variety of interventions with proven effectiveness.

Fill the Nutrient Gap (FNG)

Fill the Nutrient Gap (FNG) is an analytical process to build commitment, inform programmes and promote delivery at scale of proven interventions best suited to the local context. FNG analysis engages multiple sectors, recognizing the need for a shared understanding of issues, contexts and solutions. Stakeholders identify barriers to meeting nutrient intake requirements for specific target groups and the entry points that can improve access to nutritious diets.

The FNG approach consists of Cost of the Diet (CoTD) analysis to estimate the cost of a nutritious diet, and its affordability across the country. It also models interventions to estimate the potential impact of programmes and policies to improve access to nutritious diets. CoTD findings are combined with secondary data analysis on the current state of vulnerable populations,

food systems and social protection platforms. This ensures modelled interventions are relevant to the local context.

The FNG analytical process has been completed in 20 countries and is underway in another 10 as of October 2019. FNG findings have informed the design and implementation of national nutrition policies and programmes, the development of social protection programming, the prioritization of key interventions and the alignment of different actors' nutrition strategies.

FNG in Myanmar: Purpose

In response to the Government of Myanmar's goal of improving nutrition outcomes, the National Nutrition Centre (NNC), under the Ministry of Health and Sports (MoHS), and the World Food Programme (WFP) collaborated to conduct a Fill the Nutrient Gap (FNG) analysis in 2019. The FNG process brought together stakeholders from a variety of sectors including health, agriculture, social development, education and the private sector. It identified overlap and potential alignment across sectors for a strengthened nutrition response.

The FNG analysis and its stakeholder engagement process facilitated a greater understanding of food systems and nutrition contexts across the country. The results from the FNG support operationalization of Myanmar's Multi-sectoral Plan of Action for Nutrition (MS-NPAN) by identifying and prioritizing context-specific policies and programme packages that can improve nutrient intake of target groups through improved access to, and choice of, nutritious food.

FNG in Myanmar: Process

The FNG process in Myanmar was led by the Ministry of Health and Sports (MoHS), with WFP providing technical assistance. FNG analysis was supported by guidance and input from secondary data sources, CoTD modelling and the development of recommendations by Ministry of Agriculture, Livestock and Irrigation (MoALI), Ministry of

Education (MoE), Ministry of Social Welfare, Relief and Resettlement (MoSWRR), United Nations Children's Fund (UNICEF), Food and Agricultural Organization (FAO), WorldFish, PATH, Catholic Relief Services (CRS), Welt Hunger Hilfe (WHH) and Helen Keller International (HKI).

The process started in October 2018 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. The FNG

team then conducted preliminary analysis and returned to Myanmar in June 2019 for a national workshop and bilateral meetings. Stakeholders reviewed and commented on preliminary findings and informed the analysis with details for additional intervention modelling. The FNG team then completed final revisions to the analysis with complete intervention modelling. In October 2019 final results were presented and stakeholders developed recommendations based on FNG findings (Figure 1).

Figure 1: Overview of the FNG process and timeline in Myanmar.



Overview of FNG Myanmar findings

In Myanmar nine out of ten households could afford a diet that meets energy needs but only four out of ten could afford a diet that meets nutrient needs. Adolescent girls make up 33 percent of the household cost of a nutritious diet, the largest proportion of any household member. Targeted interventions can reduce the cost of a nutritious diet for key vulnerable groups, with reductions as high as 60 percent for children under two and lactating women and 40 percent for adolescent girls.

Long-term solutions to malnutrition require transformation of the food system along food supply chains, in food environments and across consumer behaviour patterns if Myanmar is to facilitate healthier diet choices. After recent increases in overall food production, now is the time to diversify the food supply chain to increase the availability of nutritious food. Homestead gardens are one strategy to increase production and consumption of fruit and vegetables. FNG CotD analysis found that a homestead garden could reduce the cost of a nutritious diet for a model household by 15 percent.

Food environments vary throughout Myanmar, depending on diversity of ethnic groups, livelihoods, seasonality, conflict and economic status. In some rural areas, home production of fish ponds can reduce the cost of a nutritious diet by up to 20 percent. In urban areas, lack of time and purchasing power, combined with an abundance of inexpensive processed foods, has led to an increasing prevalence of overweight and obesity alongside persistent child undernutrition. CotD analysis found that consumption of unhealthy snacks (high in energy and low in nutrients)

increases the cost of a nutritious diet by over 20 percent for adolescent girls and over 90 percent for children under 2.

Analysis of household food consumption patterns found that current diets are not meeting the energy needs of most of the poorest households in Myanmar. In the lowest wealth quintile, food expenditure and consumption are based on grains and oil, with low consumption of other food groups. One strategy to improve access to nutritious foods is to provide cash transfers, accompanied by messaging to ensure beneficiaries know which foods are nutritious and the benefits of eating nutritious foods. Provision of the Maternal and Child Cash Transfer (MCCT) of 15,000 kyat per month could reduce the daily cost of a nutritious diet for beneficiary households by 8 percent.

Improving nutrition requires multi-sectoral engagement and coordination at the individual, institutional and system levels, especially to reach marginalized and vulnerable populations. School meals and emergency rations offer platforms to improve access to healthy diets. These interventions can be improved with the provision of additional fresh foods and with fortified rice in social safety nets.

Combining effective interventions could reduce the cost of a nutritious diet from 61 percent (average of modelling areas) to as low as 25 percent. To map the way forward, stakeholder recommendations were developed during FNG Myanmar dissemination in October 2019 and will be added to an updated version of this summary report. Evidence for modelled interventions, contextual analysis and insights from local decision-makers and experts, all suggest that now is the time to take action for nutrition in Myanmar.



FILL THE NUTRIENT GAP: SITUATION ASSESSMENT FOR MULTI-SECTORAL DECISION-MAKING ON THE PREVENTION OF MALNUTRITION¹

Malnutrition has two direct causes: inadequate nutrient intake and disease. As its name specifies, the Fill the Nutrient Gap (FNG) assessment focuses on gaps in nutrient intake to inform a country's national policies on actions that can be taken to improve nutrition among their population, with a focus on the most vulnerable.

The FNG assesses the extent to which people have choices. It considers the availability, physical access and affordability of nutritious foods required for adequate nutrient intake. It seeks to understand why people make the food choices they do. Finally, it identifies context-appropriate interventions that can be implemented by different sectors to fill nutrient gaps.

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 linear programming software developed by Save the Children (UK),

and includes modelling of the economic impact of possible interventions to increase nutrient intake.

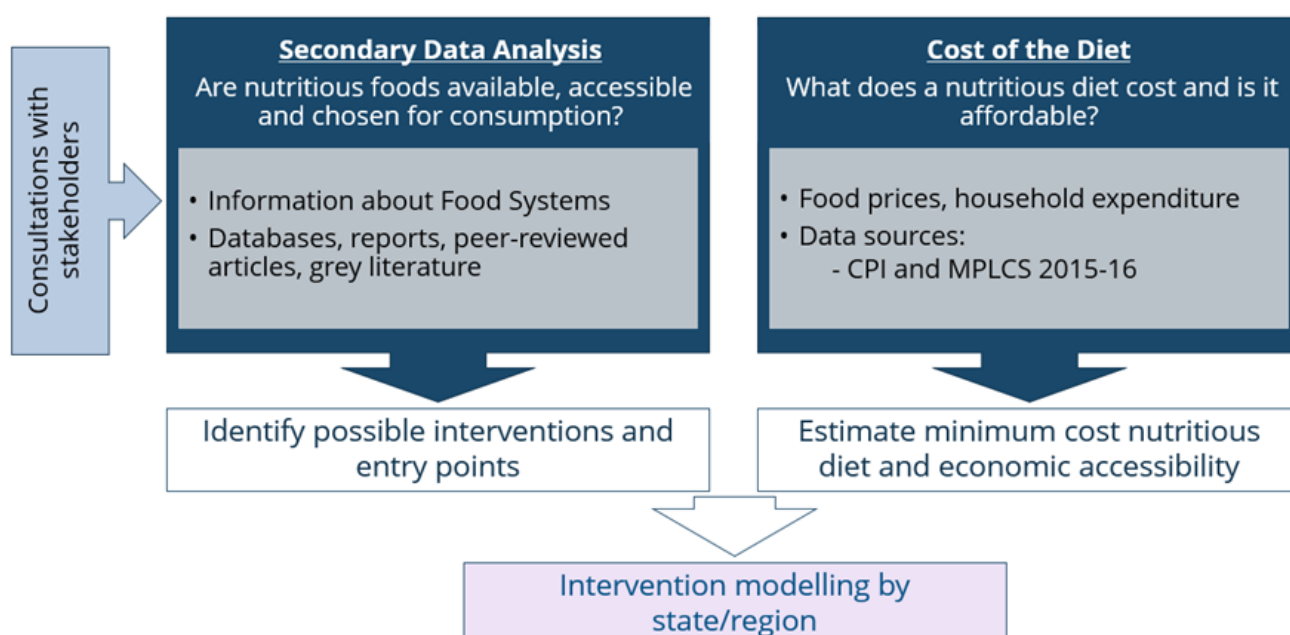
Malnutrition cannot be addressed by one sector alone. FNG is designed to inform multisectoral decision-making and therefore engages stakeholders from all sectors including food, health, agriculture, education, and social protection systems throughout the assessment.

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 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 and others.

The FNG assessment has been developed by the WFP with technical support from: 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.

The FNG has been completed in 20 countries and is ongoing in another 10, as of October 2019.

Figure 2: Overview of Fill the Nutrient Gap analytical components.



¹ 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

COST OF THE DIET (CotD) ANALYSIS

CotD software uses linear programming to understand the extent to which poverty, food availability and 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 cost of local food that is required to provide individuals or households with their average needs for energy and their recommended intakes of protein, fat and micronutrients². 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: the lowest cost nutritious diet that includes the typical staple food and excludes food that is considered taboo³. This diet is referred to as the 'nutritious' diet throughout this summary. 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.

As part of the FNG process, CotD analysis was undertaken for the 15 regions and states in Myanmar. The 2015-16 Consumer Price Index (CPI), shared by the Myanmar Central Statistical Organization (CSO), provided data on food prices and availability. The 2015 Myanmar Poverty and Living Conditions Survey (MPLCS) provided data on household food expenditure, including monetised consumption of self-produced food.

The lowest cost of a nutritious diet was estimated for a modelled household of five members, which included a breastfed child of 12–23 months, a child of 6–7 years, an adolescent girl of 14–15 years, a lactating woman and an adult man. Two rice-based meals per day were included to account for approximately 50 percent of dietary energy from preferred staples. This was done for all household members except the child aged 12–23 months, who received one portion per day. Additional servings of rice could be selected by the software.

CotD software was used to model interventions proposed by stakeholders with the objective of improving the affordability of a nutritious diet for individuals and households. Based on the Multi-Sectoral National Plan of Action for Nutrition (MS-NPAN) priority regions, seven regions and states were selected for modelling: Ayeyardwaddy, Chin, Shan, Kayah, Kachin, Kayin and Rakhine (Figure 3).

The selection of potential interventions for modelling was informed by secondary data review and stakeholder consultations. It included:

- increased availability of local nutritious food;
- complementary food or specialised nutritious foods (SNF) made available through the market and/or social safety nets;
- micronutrient supplementation;
- fortification of staple food and;
- conditional cash transfers for vulnerable households.

Modelled interventions are theoretical and would need to be accompanied by complementary behaviour change interventions to promote nutritious choices by consumers.

Figure 3: Highlighted modelling states and regions included as modelling areas for FNG analysis.



²As defined by the Food and Agriculture Organization (FAO) and the World Health Organization (WHO). The need for 9 vitamins and 4 minerals is included.

³This 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.

Malnutrition overview

Myanmar suffers a high burden of child undernutrition. The prevalence of stunting (low height-for-age) has decreased from 41 percent in 2003 to 27 percent for children under 5, classified as high by the World Health Organization (WHO). This puts Myanmar roughly on track to achieve the national target of 21 percent by 2025. Despite commendable progress, as of 2015/16, stunting prevalence is high or very high in 14 out of 15 states and regions (Figure 4), with 1.2 million children were stunted in Myanmar. Sustained efforts are needed to continue reducing stunting. Stunting prevalence varies between 21 percent (Yangon) and 40 percent (Chin), but due to differing population densities, prevalence does not correspond to caseload: 110,000 in Yangon and 26,000 in Chin.

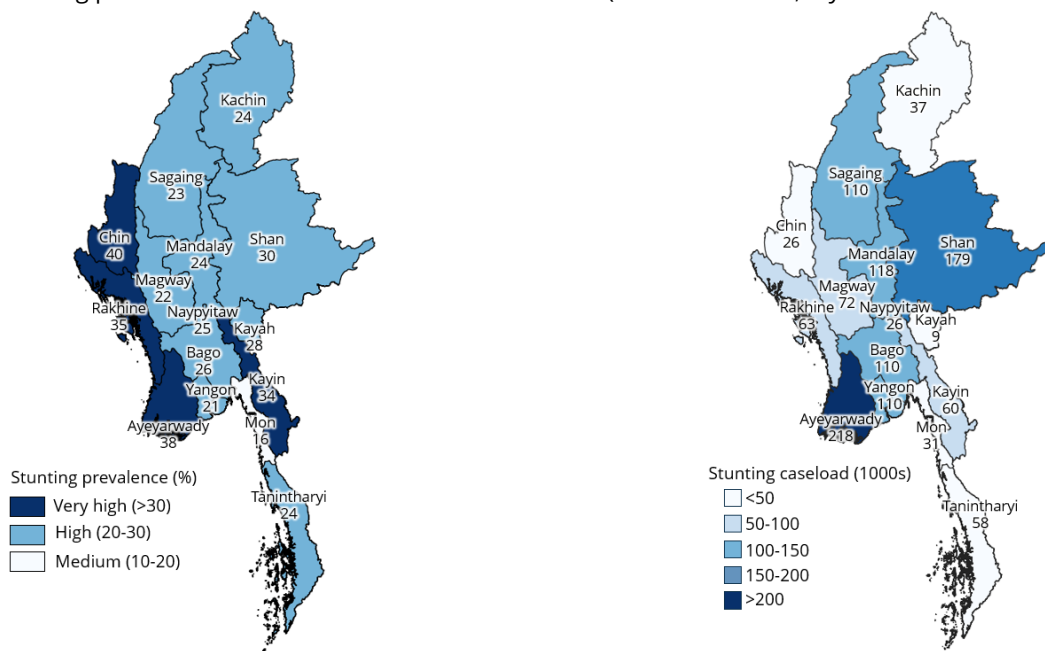
The prevalence of wasting (low weight-for-height) is 7 percent for children under 5, classified as medium by WHO. Wasting prevalence was 11 percent in 2003, and the

current trend does not put Myanmar on track to achieve the national goal of 5 percent by 2025.

Among women of reproductive age (WRA) (15-49 years old) 14 percent are underweight (BMI<18.5), 30 percent are overweight or obese, an increase from 18 percent in 2003, and 30 percent have anaemia. 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 current situation in Myanmar, this summary report aims to estimate gaps in adequate nutrient intake, share an understanding of the barriers to accessing nutritious foods and identify interventions that can improve access to nutritious diets, enabling better nutritional outcomes.

Figure 4: Stunting prevalence and caseload for children under 5 (MMFCS 2017-18, Myanmar Census 2014).



FNG in Myanmar: Findings⁴

1.

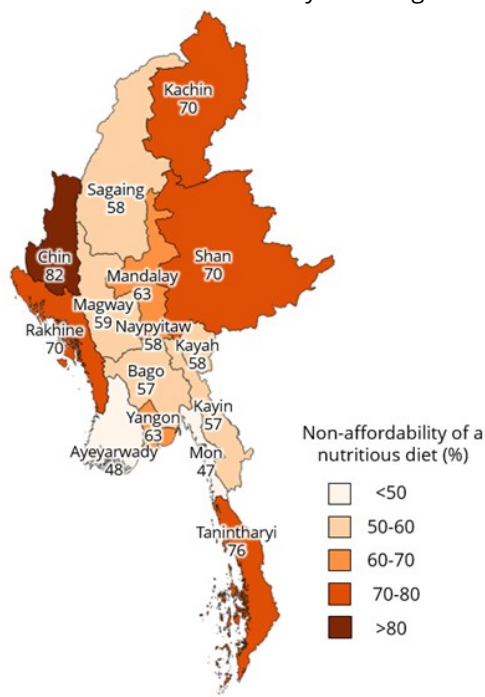
NINE OUT OF TEN HOUSEHOLDS IN MYANMAR COULD AFFORD A DIET THAT MEETS ENERGY NEEDS BUT ONLY FOUR OUT OF TEN COULD AFFORD A DIET THAT MEETS NUTRITIONAL NEEDS.

Nationwide the average cost of an energy only diet for the modelled five-person household was 1,963 kyat per day. On average, 10 percent of households would not be able to afford the energy only diet. Energy only non-affordability varied considerably throughout the country, with a high of 35 percent in Chin state, followed by 30 percent in Rakhine state and 25 percent in Tanintharyi.

The average cost of a nutritious diet was more than double the cost of the energy only diet: 4,358 kyat per day. Nationwide, 60 percent of households would not be able to afford a nutritious diet. In nearly all regions and states the majority of households could not afford a nutritious diet (Figure 5). The highest non-affordability estimates were in the hilly, mountainous and coastal areas. In Chin state 82 percent of households could not afford the nutritious diet, followed by 76 percent in Tainintharyi and 70 percent in Rakhine, Kachin and Shan states.

Cost of a nutritious diet, based on food prices and availability, is a primary driver of non-affordability. The five states and regions with the highest non-affordability had the highest cost of a nutritious diet, outside from Yangon, where residents have more purchasing power. The daily cost of a nutritious diet for the model household was as high as 6,477 kyat in Chin state.

Figure 5: Non-affordability of a nutritious diet for the FNG modelled household by state/region.



2.

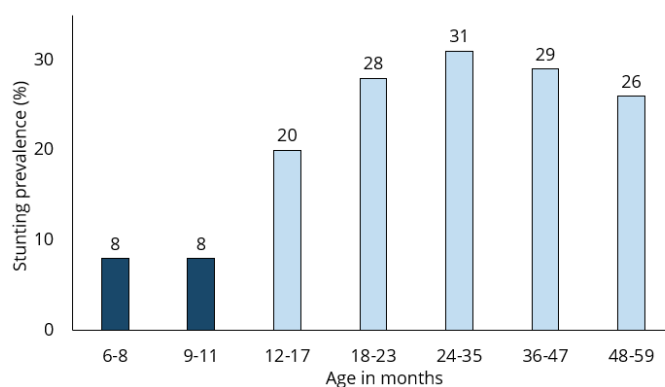
DIETARY DIVERSITY AND FEEDING PRACTICES OF YOUNG CHILDREN IN MYANMAR ARE SUBOPTIMAL. SPECIALISED NUTRITIOUS FOODS, MICRONUTRIENT SUPPLEMENTATION AND IMPROVED BREASTFEEDING PRACTICES CAN SUPPORT CAREGIVERS IN PROVIDING NUTRITIOUS DIETS TO YOUNG CHILDREN.

Stunting is a concern throughout Myanmar, with prevalence classified as high (>30 percent) or very high (>40 percent) in 14 out of 15 regions and states. A direct cause of stunting is inadequate diets among infants and young children. Among children aged 6-23 months only 16 percent consume a minimum acceptable diet (MAD). 58 percent of children 6-23 months meet the standard for minimum meal frequency (MMF) and 25 percent of children 6-23 months meet the standard for minimum dietary diversity (MDD), highlighting the need to diversify diets of young children.

The following contributing factors have been identified as barriers to adequate diets for young children: a burdensome workload for women, inadequate access to, and availability of, food, especially nutritious food, and cultural beliefs about what foods young children can eat and when these foods can be introduced.

By age, stunting peaks during and after the period of complementary feeding. Prevalence is at 28 percent for children 18-23 months old and 31 percent for children 24-35 months old (Figure 6). These figures reflect a sharp increase from a prevalence of 8 percent for children under 6-8 months and 9-11 months of age. This finding indicates inadequate diets during the period of complementary feeding are likely primary drivers of stunting among infants and young children.

Figure 6: Stunting prevalence by age of child in months (MMFCS 2017-18).



The Myanmar Micronutrient and Food Consumption Survey (MMFCS 2017-18) found that at the household level children in food insecure households and children in households with

⁴ Complete details of the findings, a full list of data sources used, and references can be found in the full report.

lower dietary diversity scores are more likely to be stunted. 36 percent of children in severely food insecure households are stunted compared to 24 percent of children in food secure households. Stunting is strongly associated with wealth and residence poorer children and children in rural areas are more likely to be stunted. Stunting prevalence varies geographically and of the five regions/states with a very high prevalence (>30 percent) three are hilly and mountainous, one is coastal and the other is delta.

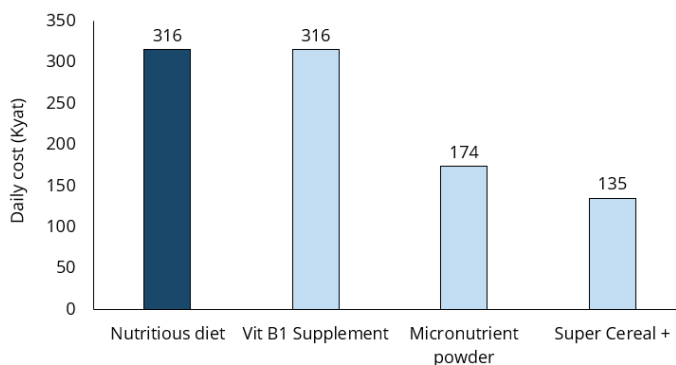
The socio-economic pattern for wasting in children under 5 differs from stunting - children in wealthier households and urban areas were as likely or almost as likely to have wasting as children in poorer households and rural areas. This finding highlights the need to improve nutrition for all segments of the Burmese population.

To estimate the potential impact of improving diets of young children, the following products were modelled for a child aged 12-23 months using CotD software: vitamin B1 supplement, micronutrient powder and Super Cereal+.

Of the three modelled interventions Super Cereal+ had the biggest potential impact, with an estimated reduction in cost for the child under 2 from an average of 316 kyat per day across the modelling states and regions to 135 kyat, a decrease of almost 60 percent. The estimated cost decrease represents an eased financial burden for caretakers to ensure infants and young children are consuming a nutritious diet (Figure 7).

For a child 12-23 months old, CotD modelling compared optimal breastfeeding with 50 percent breastfeeding instead of recommended quantities and no breastfeeding. CotD analysis found that with no breastfeeding the cost of a nutritious diet for the child increased by almost 20 percent. This finding illustrates the importance of breastfeeding, the value of promoting good breastfeeding habits, and enabling opportunities for mothers to continue breastfeeding, provided their nutrition needs are met to ensure breastmilk will be of assumed and desired quality. Myanmar has seen improvement in continued breastfeeding rates in recent years. The continuation of this trend is a key opportunity to improve nutrient access for young children.

Figure 7: Daily cost of a nutritious diet for a child under two with targeted interventions (average of modelling areas).

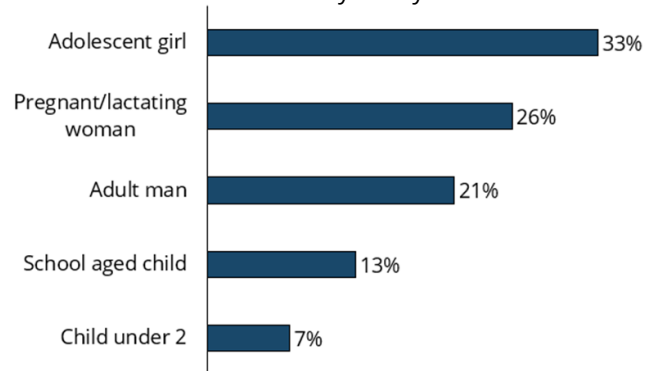


3.

MEETING THE NUTRITIONAL NEEDS OF ADOLESCENT GIRLS AND PREGNANT AND BREASTFEEDING WOMEN WOULD COST THE HOUSEHOLD THE MOST. THEIR MICRONUTRIENT NEEDS ARE HIGHER, AND THEY REQUIRE THE LARGEST SHARE OF MORE EXPENSIVE NUTRITIOUS FOODS. THIS IS GENERALLY NOT CONSIDERED IN HOUSEHOLD FOOD ALLOCATION, PUTTING THEM AND THEIR (UNBORN) CHILDREN AT GREATER RISK OF MICRONUTRIENT DEFICIENCIES. DIETARY SUPPLEMENTATION CAN REDUCE THE COST OF A NUTRITIOUS DIET.

CotD analysis identified adolescent girls and lactating women as having the most expensive nutritious diets in the modelled household due to high nutrient requirements compared to energy intake. These two household members comprised almost 60 percent of the total household nutritious diet cost (Figure 8).

Figure 8: Average distribution of household cost of a nutritious diet by family member.



In many cases food allocation, in terms of quantity and sharing of food preferred by households, is not based on nutrient-density needs but on perceived energy requirements and intra-household dynamics. This finding suggests an insufficient proportion and total amount could be allocated to household members in need of more nutrient-dense foods. Prioritisation and improving purchasing power for households to buy nutritious food are crucial for improving access to nutritious diets.

To estimate the potential impact of improving diets for adolescent girls and lactating women, the following products were modelled using CotD software: vitamin B1 supplement, iron and folic acid (IFA), multi-micronutrient tablet (MMT) and a portion of school milk for adolescent girls.

Of the modelled interventions MMT had the biggest potential impact, with an estimated reduction in cost for lactating women, from an average of 1,154 kyat per day across the modelling areas to 512 per day, a decrease of 56 percent (Figure 9). For adolescent girls, MMT reduced the cost of a nutritious diet from 1,471 kyat per day across the modelling areas to 854 kyat, a decrease of 42 percent (Figure 10).

Figure 9: Daily cost of a nutritious diet for lactating women with targeted interventions (average of modelling areas).

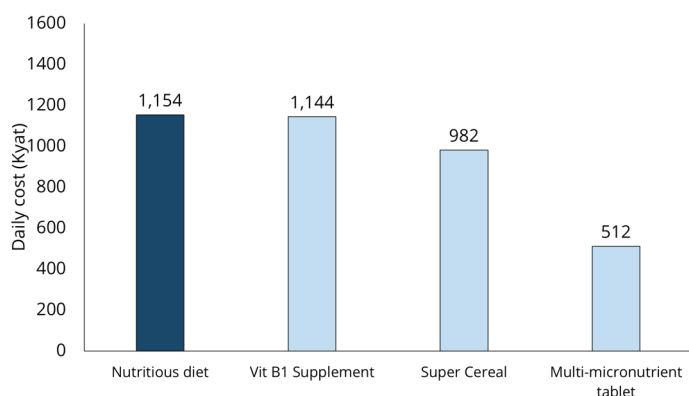
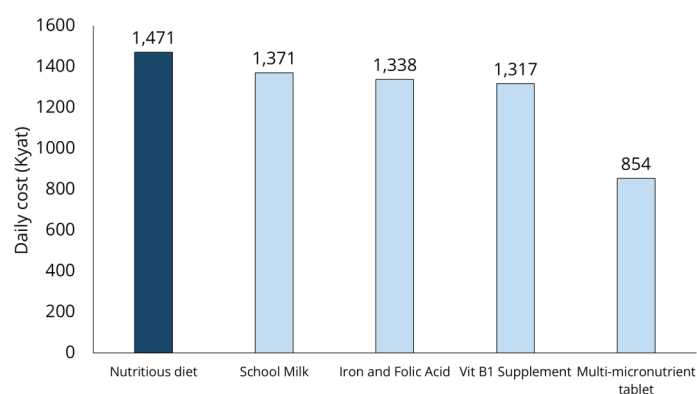


Figure 10: Daily cost of a nutritious diet for adolescent girls with targeted interventions (average of modelling areas).

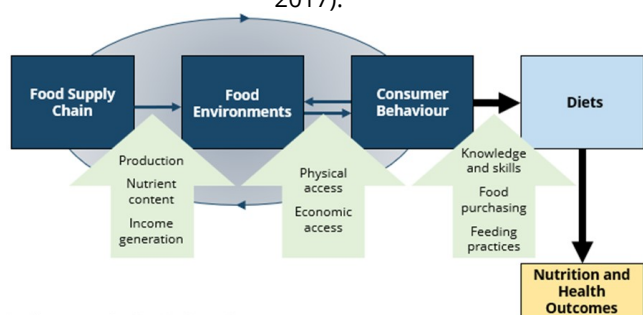


4.

AGRICULTURE IS CENTRAL TO BUILDING A MODERN INDUSTRIALIZED MYANMAR. AFTER A REMARKABLE INCREASE IN PER CAPITA FOOD PRODUCTION IN RECENT DECADES, NOW IS THE TIME FOR MYANMAR TO DIVERSIFY THE FOOD SUPPLY CHAIN TOWARD NUTRITIOUS FOODS. FRUIT AND VEGETABLE PRODUCTION FROM HOUSEHOLD GARDENS CAN INCREASE ACCESS TO NUTRITIOUS FOODS FOR RURAL HOUSEHOLDS.

Long-term solutions to malnutrition require transformation of the food system along food supply chains, in food environments and across consumer behaviour patterns to facilitate healthier diet choices (Figure 11). Healthy foods must be available and affordable, consumer demand for

Figure 11: Food systems for diets and nutrition and health outcomes framework (adapted from HLPE, 2017).



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

⁵ 1,800 kcal daily per capita provides deficient amounts of protein and fats and fails to deliver a balanced diet. The indicator is based on the human body adapting to low-energy intake.

these foods must be strengthened and an enabling environment must support stakeholders who want to improve food systems.

The food system is built on the food supply: agriculture is central to building a modern industrialized Myanmar. Agriculture represents one-third of national economic output, three out of five in the workforce are involved in agriculture and agricultural exports have tripled since 2010. However, labour productivity from agriculture is one tenth that of neighbouring Thailand, showing room for improvement from increased investment and adoption to support the use of modern techniques and mechanization.

Myanmar has seen a remarkable improvement in per capita food production in recent decades. The percentage of the population whose caloric needs would not be met by the domestic food supply (1,800 kcal per capita per day⁵) has decreased significantly from 63 percent of the population in 1990 to 11 percent in 2017. The expansion in food production has surpassed population growth and these figures represent a reduction from 27 million people whose caloric needs would not have been met by domestic food supply in 1990 to 5.6 million people in 2017.

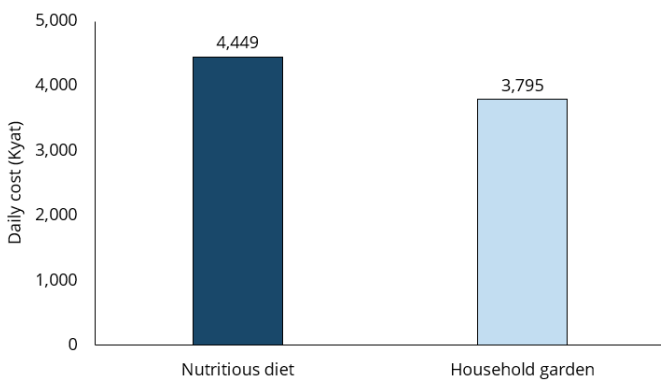
After experiencing significant growth in domestic food production, there is new potential for Myanmar to expand from producing enough food to diversifying production and increasing productivity. Currently, production is dominated by rice, with 1.2 kilograms of rice per capita produced daily, followed by sugarcane with close to 500 grams per capita produced daily. In comparison, 270 grams per capita of vegetables are produced daily and less than 70 grams per capita of fruit are produced daily. Around 250 grams per capita of beans are produced daily, contributing to US\$1.4 billion annual earnings from beans and pulses exported predominately to India.

Diversifying production away from rice has potential nutritional and economic benefits for those dependent on agriculture as a livelihood. At present, smallholder farmers are trapped in a cycle of low productivity. Farmers have limited land rights and insufficient credit opportunities resulting in low investment in quality inputs. Farmers have limited land use options resulting in low revenue from not being able to optimize the crops they produce. With limited movement, potential agriculture workers cannot get to work opportunities and farms face seasonal labour shortages. These factors all contribute to low productivity agriculture.

An average of 10 percent of food by value comes from own production. The figure is slightly higher in rural areas (13 percent), among the poorest households (13 percent) and in hilly and mountainous areas (18 percent). On a state and region level, however, there is one outlier: Chin state, where almost 60 percent by value of consumed food comes from own production. Still, although their numbers are low on average, several states such as Sagaing, Kachin, Shan and Kayah are made up of geographic pockets where more than 30 percent of households largely rely on own production.

One strategy to improve access to nutritious diets is to promote household gardening, among households with access to land and water and the ability to perform the labour involved. A recent evaluation of vulnerable households in rural Myanmar found that promoting home gardens could improve food security and dietary diversity. CotD analysis modelled household gardening and found that for households producing in a weekly harvest on average: tomato (1.2 kg), roselle leaf (500 g), okra (700 g), lettuce (500 g), carrot (360 g), pepper (500 g), sweet potato (1.2 kg) and cabbage (700 g) the intervention could reduce the cost of a nutritious diet for the household by 15 percent (Figure 12), when harvest can be expected.

Figure 12: Daily cost of a nutritious diet with household garden intervention (average of modelling areas).



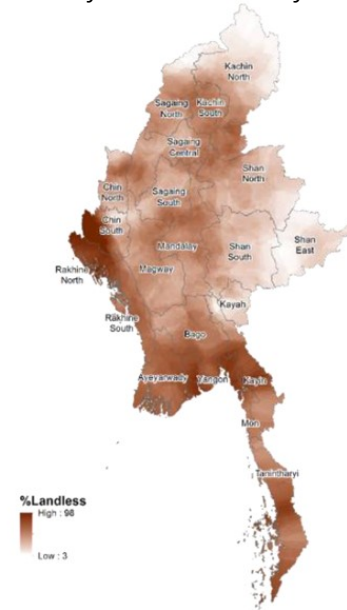
5.

MYANMAR'S RURAL FOOD ENVIRONMENT IS DETERMINED BY DIVERSE FACTORS, SUCH AS ETHNICITY, LIVELIHOOD, SEASONALITY, CONFLICT AND ECONOMIC STATUS. DEPENDING ON LIVELIHOOD SYSTEM AND ACCEPTABILITY, HOME PRODUCTION SUCH AS FISH PONDS CAN PROVIDE A RELIABLE SOURCE OF NUTRIENTS.

The food environment refers to the physical, economic, political and socio-cultural surroundings that shape people's dietary preferences, choices and nutritional status. For many households the food environment is based on foods they produce and purchase from local markets. Food environments vary across Myanmar's diverse geography. A high percentage of rural households in the delta, inland and coastal plains are landless and rely on cash from casual labour and/or credit to purchase food (Figure 13). For landless workers, on average 70 percent of household borrowing is for purchasing food, often leading to cycles of poverty and debt.

Those who do own land face different challenges. Smallholder farmers have the poorest dietary diversity in Myanmar and the lowest consumption of protein-rich foods. In remote areas, households far from markets have a difficult time selling production or purchasing food and are more likely to face food insecurity, with low dietary diversity from a greater reliance on own production.

Figure 13: Landlessness in Myanmar (WFP Food Security and Poverty Estimation Surveys 2013-2015).

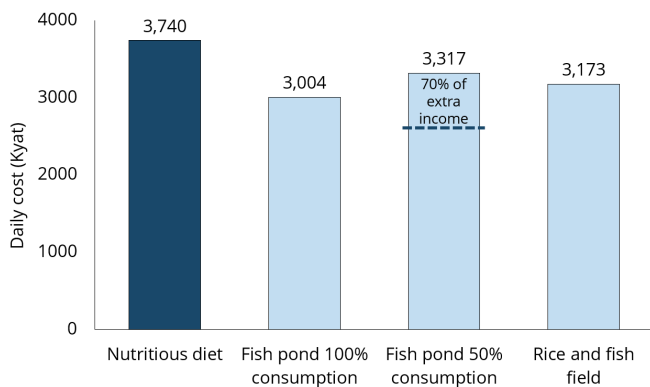


CotD analysis found the highest cost of a nutritious diet in Chin state, followed by Tanintharyi, Shan state and Kachin state. Poor market access due to challenging terrain increases the cost of a nutritious diet when suppliers travel greater distances to reach markets, passing costs on to consumers, and providing fewer nutritious foods for consumers to choose from.

Given the challenges in the region, including low market access, elevation and difficult terrain to traverse, own production can be a strategy for improved access to nutritious foods. Crop-based interventions can prove successful at higher elevations, as detailed in the previous key message. Household fish ponds can be a feasible alternative for the rural inland and coastal plains, where fewer exacerbating factors exist and impact can be particularly high due to denser populations. Trials of such interventions have been carried out across the dry zone and the delta areas of Sagaing, Magwe, Mandalay, Ayeyarwaddy, Mon and Kayin.

The FNG assessment particularly focussed on three types of fish pond interventions: 1) a small pond, with local fish (silver barb, tilapia, pangasius, rohu) exclusively for own consumption; 2) a small pond with fish for consumption and income generation (50/50); and 3) a rice paddy, with small fish species (rohu and silver barb) produced in the cultivation area for consumption. Results show that all three models reduce the cost by around 20 percent, with intervention 2 being most efficient in Ayeyarwaddy (Figure 14). Similar interventions, such as using irrigation ditches for fish production, could target vulnerable population groups that do not have access to land. This could provide the poorest households with nutrients they might otherwise not be able to access.

Figure 14: Daily cost of a nutritious diet with fish pond intervention (Ayeyarwady only).



6.

IN URBAN FOOD ENVIRONMENTS IN MYANMAR, LACK OF TIME AND PURCHASING POWER COMBINED WITH AN ABUNDANCE OF INEXPENSIVE PROCESSED FOODS HAS LED TO A RAPIDLY INCREASING PREVALENCE OF OVERWEIGHT AND OBESITY, ALONGSIDE A PERSISTENTLY HIGH CASELOAD OF CHILD UNDERNUTRITION. COTD MODELLING SHOWS THAT UNHEALTHY SNACKING INCREASES THE COST OF A NUTRITIOUS DIET BY PROVIDING CALORIES BUT NOT NUTRIENTS.

Households in urban areas, which have nearby markets, face a different set of challenges accessing nutritious foods. Proximity to nutritious food does not guarantee access, especially for low-income households unable to afford these foods. Myanmar's most significant urban area Yangon had the 5th highest cost of a nutritious diet, ranking below Chin, Tanintharyi, Kachin and Shan, four states and regions with significant constraints related to physical access to markets. In Yangon 63 percent of households would not be able to afford the nutritious diet.

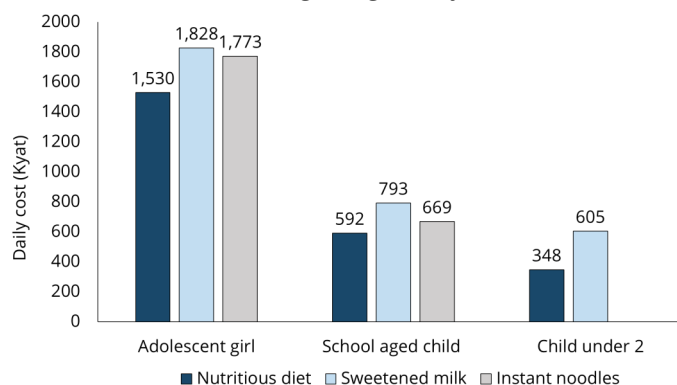
Yangon is expanding rapidly and further research is needed to better understand how urbanization impacts nutrition. The primary trigger of migration to Yangon is landlessness in Delta regions. For the urban poor and recently arrived, time is a major constraint, leading to the consumption of street food, extremely low rates of breastfeeding and poor complementary feeding practices. The urban poor also often lack safe water and sanitation and are highly vulnerable to flooding.

Overweight and obesity prevalence is higher in urban areas, including Yangon, where over 40 percent of women of reproductive age are overweight or obese. This may be partially explained by easy access to foods and drinks high in fat and sugar, but low in essential nutrients. The CotD assessment estimates that twice-weekly consumption of sweetened milk or instant noodles at market prices (225 kyat and 263 kyat per portion respectively) increases the daily cost of a nutritious diet by around 300 kyat per day for

adolescent girls and 200 kyat per day for school-aged children in Yangon (Figure 13). Anecdotal information exists that sweetened milk (mostly sugar with little milk content) is sometimes given to children under 2 and this was also modelled. Results showed that this unhealthy practice almost doubled the daily cost for an infant.

The increase in overweight and obesity is particularly concerning. If policies and programmes focus exclusively on undernutrition, overweight and obesity could become a rising problem as Myanmar continues to experience economic growth and urbanization.

Figure 15: Daily cost of a nutritious diet with unhealthy snacking (Yangon only).



7.

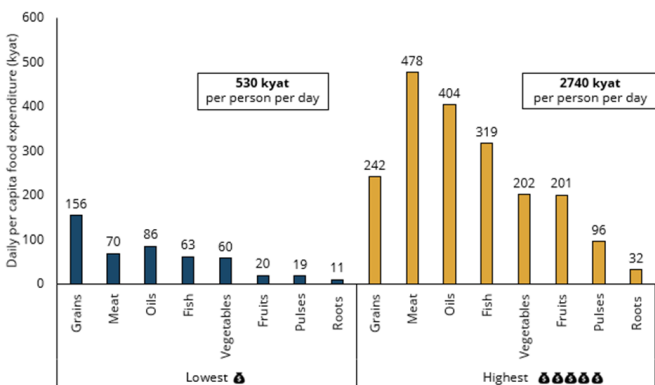
THE LOWEST WEALTH QUINTILE IN MYANMAR PRIORITIZES GRAINS IN FOOD CONSUMPTION, WITH LOW EXPENDITURE ON OTHER FOOD GROUPS. LIMITED ECONOMIC ACCESS AND POOR KNOWLEDGE OF WHAT CONSTITUTES A HEALTHY DIET ARE BARRIERS TO ACCESSING NUTRITIOUS FOODS. A CASH-BASED TRANSFER COMBINED WITH SOCIAL BEHAVIOUR CHANGE COMMUNICATION (SBCC) COULD IMPROVE ACCESS TO NUTRITIOUS DIETS.

Consumer behaviour refers to the choices made by households and individuals determining which foods to buy, prepare and eat and how foods should be allocated among household members. Consumer behaviour in the food system is influenced by the food environment, which is influenced by the food supply, with feedback and interaction across the three constituent elements.

In Myanmar, an analysis of purchasing patterns by wealth quintile finds that households in the richest wealth quintile spend on average 2,740 kyat per person per day, with the most money spent on meat, followed by oils, fish, grains, vegetables and fruit. In contrast, households in the poorest wealth quintile spend on average 530 kyat per person per day (less than 20 percent of what the richest spend), with the most money spent on grains, followed by oils, meat, fish, vegetables and fruits (Figure 16).

Figure 16: Daily per capita food expenditure for lowest and highest wealth quintiles (MPLCS 2015, own calculation).

This finding suggests that the poorest households prioritize



energy needs by consuming grains, with few resources available for a diverse diet. One potential strategy to improve access to a nutritious diet – with more consumption from nutritious food groups – would be to provide the poorest households with cash transfers, accompanied by SBCC to increase the likelihood that cash transfers would be spent on nutritious foods.

Currently two large cash-based social safety nets are implemented in Myanmar: Maternal and Child Cash Transfer (MCCT) programme, providing 15,000 kyat per month to pregnant and breastfeeding women through the child’s second year. Additionally, Food for Assets (FFA), a WFP programme targeting vulnerable households and providing 4,000 kyat per day worked for a maximum of 20 days per month. Both programmes have the potential to improve nutrition for vulnerable groups, if the money is dedicated to fresh, nutritious foods.

For cash transfers to improve nutrition, three conditions must be met: 1) nutritious foods are available for beneficiary households; 2) households know which foods are nutritious, and; 3) households have a desire to purchase and consume nutritious foods. At scale, a cash transfer intervention must consider the amount needed to deliver impact, the proportion of the population in need of cash transfer, and the ability of implementers to mobilize required resources.

A recent study on the interface between consumers and food environments in Yangon (one upper-income township and one lower-income township), Tanintharyi (one middle-income township) and Magway (one lower-income township) found that economic affordability, not availability, was considered a barrier to accessing preferred foods. However, focus group participants had limited knowledge of what constitutes a healthy diet. These two findings together suggest cash transfers combined with SBCC could be an effective strategy for improving consumption of nutritious foods and reducing inadequate nutrient intake.

8.

BASED ON AN ANALYSIS OF CURRENT DIETS, THE MAJORITY OF THE POOREST HOUSEHOLDS IN MYANMAR ARE NOT MEETING ENERGY NEEDS. THE AVERAGE DIET FOR MYANMAR IS BASED ON GRAINS AND OILS, WITH SOME CONSUMPTION OF VEGETABLES, FRUIT, MEAT AND FISH. IF HOUSEHOLDS WERE TO CONSUME FORTIFIED RICE IT WOULD REDUCE THE COST OF A NUTRITIOUS DIET.

Diets reflect what’s made available by the food system. Through consumer demand and regulation, they drive future food systems. Interactions across food supply chains, food environments and consumer behaviour patterns determine the items, quantities, proportions and combinations of foods and beverages consumed by households and individuals. Healthy diets should meet energy needs, provide a diversity of foods of high nutritional quality and be safe.

An analysis of current diets across Myanmar, based on household consumption data, found that an estimated 41 percent of households were not meeting energy needs. Among the lowest wealth quintile, the percentage rose to 69 percent. Across agro-ecological zones, the highest percentage of households not meeting energy needs with current diets was in Yangon at 60 percent.

To better understand the typical Myanmar diet, average consumption by weight by food group was calculated. Grains were consumed in the highest quantity, on average 419 g consumed daily per capita, followed by vegetables (216 g), fruit (103 g), oils (97 g), meat (65 g), fish (60 g), roots (38 g) and pulses (34 g) (Figure 17). Comparing the lowest wealth quintile with the highest, grains make up a greater percentage of the diet by weight for the poorest households, with low consumption of vegetables, fruit and animal-source foods, contributing to a greater risk of micronutrient deficiencies for the poorest households (Figure 18).

Figure 17: Average daily per capita consumption by food group for lowest and highest wealth quintile (MPLCS 2015, own calculation).

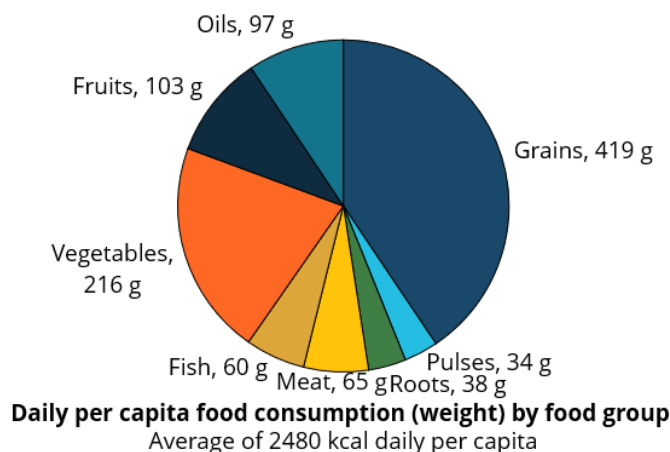
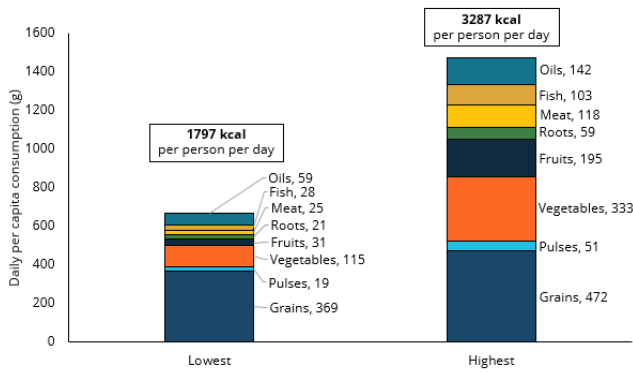
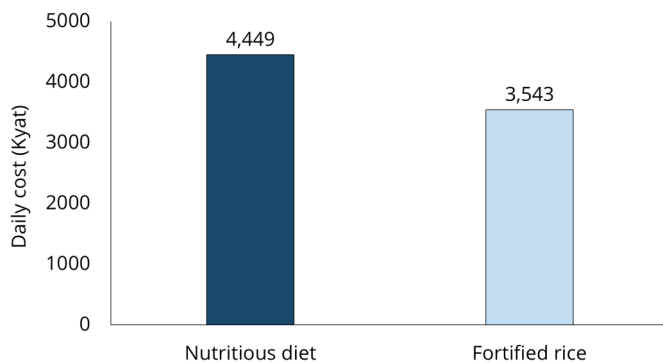


Figure 18: Average daily per capita consumption by food group for lowest and highest wealth quintile (MPLCS 2015, own calculation).



Because the typical diet is based on rice, one strategy to improve nutrient intake is to encourage the production and consumption of fortified rice. CotD analysis included a model in which households consumed rice fortified with iron, zinc, vitamins A, B1, B2, B6, B12 and folic acid. By adopting fortified rice at 10 percent higher market prices than unfortified rice, the average daily household cost of a nutritious diet for households in the modelling regions was reduced from 4,449 kyat to 3,543, a 20 percent cost reduction (Figure 19).

Figure 19: Average daily cost of a nutritious diet with fortified rice (average of modelling areas).



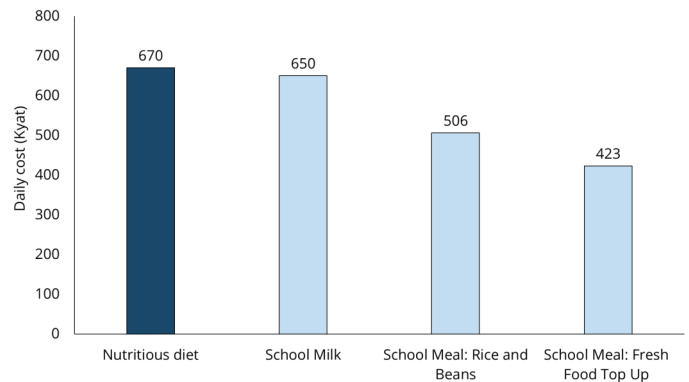
9.

IMPROVING NUTRITION REQUIRES MULTI-SECTORAL ENGAGEMENT AND COORDINATION AT THE INSTITUTIONAL AND SYSTEM-LEVELS, ESPECIALLY FOR THE MARGINALIZED AND MOST VULNERABLE POPULATIONS TO MEET THEIR NEEDS. THE IMPACT OF SCHOOL MEALS AND EMERGENCY RATIONS CAN BE IMPROVED BY PROVIDING ADDITIONAL FRESH FOODS AND FORTIFIED RICE.

One opportunity to improve nutrition for a vulnerable population is through the education sector with school meals. The Department of Education will provide 350 ml of milk to students every 10 days, starting in 2021. WFP is currently delivering school meals to students in 11 states and regions. The current WFP ration consists of rice and beans. WFP has been in discussions to expand the school meal with a top up of additional fresh foods, for example

dried fish and green leafy vegetables. CotD analysis found that in Shan state, where WFP is currently operating, by providing the planned quantity of milk, the cost to the household of providing a nutritious diet for a school-aged child averaged across the modelling areas would reduce from 670 to 650 kyat per day. This is compared to a reduction to 506 kyat with rice and beans, and a reduction to 423 kyat per day for the top up with dried fish and green leafy vegetables (Figure 20).

Figure 20: Average daily cost of a nutritious diet for a school-aged child with different school feeding interventions (Shan state).

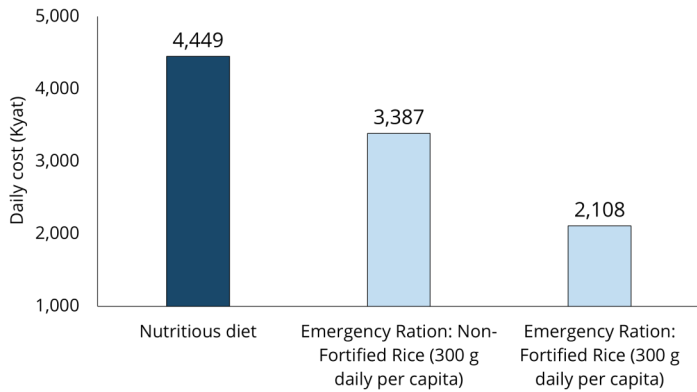


WFP currently provides an emergency ration of rice to beneficiaries in Northern Rakhine State, Central Rakhine, Shan State and in emergency response operations in any area where flooding has occurred. The ration of 13.5 kg of rice per person per month equates to 450 g per person per day and 1,620 kcal, exceeding the WHO recommendation that no more than 50 percent of energy come from cereal grains, provided the other 50 percent of energy can come from other foods. To deliver this amount, WFP could reduce the ration to 9.1 kg of rice per person, equating to 300 g per person per day and 1080 kcal.

CotD analysis estimated the reduction in the cost of a nutritious diet if households were to receive the 9.1 kg of rice per person ration and the added benefit if rice were fortified. Non-fortified rice could reduce the cost of the nutritious diet for households in the modelling areas from 4,449 kyat per household per day to 3,387 kyat, representing a 24 percent reduction. Fortified rice could reduce the cost further to 2,108 kyat per household per day, representing a 53 percent reduction in the cost of a nutritious diet for beneficiary households (Figure 21).

In the context where emergency rations are being provided it is unlikely households would be able to afford the remaining costs to purchase a nutritious diet. To improve nutrient intake additional assistance should be provided in the form of other foods, specifically fresh food vouchers or specialized nutritious foods for specific target groups.

Figure 21: Average daily cost of a nutritious diet for the modelled household with the emergency ration and with fortified rice as the emergency ration (average of modelling areas).



10.

INTRODUCING MS-NPAN INTERVENTIONS FROM ALL SECTORS CAN SIGNIFICANTLY REDUCE THE COST AND NON-AFFORDABILITY OF NUTRITIOUS DIETS.

Improving nutrition in Myanmar requires action from all sectors. To estimate the impact of combined interventions, different household packages were modelled with cash transfers, based on available social safety nets. The combination reflects different priorities from the MS-NPAN interventions, as outlined in the table below (Table 1).

Interventions were selected that reflect different livelihood dynamics. For example, the HKI home garden was modelled in the mountainous states and regions, whereas a fish pond was modelled as part of the package for the delta states and regions. Results of the appropriate models were then averaged to demonstrate impact on a national level. The results show that a combination of targeted interventions and the Maternal and Child Cash Transfer (MCCT) can reduce the cost of a nutritious diet. For the modelled household, receiving package 1 and the MCCT would reduce the nutritious diet cost from 4,449 kyat per day to 2,415 kyat per day (Figure 22).

Achieving this impact can only be achieved with support from multiple stakeholders across the following systems: food (agricultural interventions), health (supplementing diets with specialized nutritious foods or micronutrient supplements), education (healthy, nutritious school meals), and social protection (cash transfers for the most vulnerable).

Assuming all households would be eligible for the modelled interventions, non-affordability of a nutritious diet could be reduced from 61 percent to 25 percent, making a nutritious diet available for almost all.

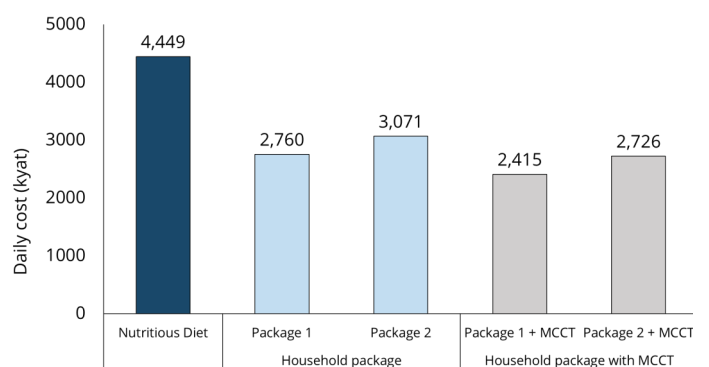
These results demonstrate the possible effects that could be gained from increasing household access to nutritious foods with a package of interventions delivered across multiple entry points and sectors. The underlying assumption is that

adequate demand-creation strategies are in place to ensure that cash transfers or vouchers provided would be spent on nutritious food which would be consumed by the targeted individuals.

Table 1: Modelled interventions included in household packages.

Target Group	Package 1	Modality	MSNPAN Activity
Household	Fortified Rice	Market Price	#6
	Home Garden/Fish Ponds	Own Production	#23 / #24
Adolescent girl	School Meals with Fortified Rice & School Milk	In-Kind	#17 / #4
Breastfeeding woman	Super Cereal	In-Kind	#7
School-aged child	School Meal with Fortified Rice & School Milk	In-Kind	#17
Child under 2 years	Super Cereal	In-Kind	#7
Target Group	Package 2	Modality	MSNPAN Activity
Household	Vitamin B1	In-Kind	
Adolescent girl	School Meals & School Milk & MMT	In-Kind	#17 / #6
Breastfeeding woman	MMT	In-Kind	#4
School-aged child	School Meals & School Milk	In-Kind	#17 / #6
Child under 2 years	MNP	In-Kind	#1

Figure 22: Average daily cost of a nutritious diet for the modelled household compared to two packages of interventions with and without the MCCT (average of modelling areas).



Recommendations

As part of the dissemination workshop stakeholders were asked to break out in groups to develop recommendations based on the analytical findings of the FNG. During that process stakeholders identified key steps for the different sectors, focussing on regional disparities to inform considerations for the roll-out of the MS-NPAN. Taking a dedicated multi-sectoral perspective, these points aim to support prioritization and action plans across projects and programmes.

Health	
<p>Maintain Focus on the first 1,000 days</p>	<p><u>Micronutrient supplementation for mothers and young children</u></p> <p><u>Interpersonal communication</u></p> <ul style="list-style-type: none"> ○ Mother-to-mother support groups ○ Identify change agents ○ Positive deviance models ○ Training of trainers in rural areas <p><u>Quality health center counseling and support services</u></p> <ul style="list-style-type: none"> ○ Baby Friendly Hospital Initiative and Basic Health Staff programming ○ Scale-up and increase coverage of ongoing campaigns to vaccinate, reduce parasite infections and child morbidity <p><u>Policies and regulation</u></p> <ul style="list-style-type: none"> ○ Adequate maternity leave policies that enable women to provide exclusive breastfeeding for the first six months ○ Issue breastmilk substitute code across WHO guidelines <p><u>Support pregnant and breastfeeding women and adolescent girls</u></p> <ul style="list-style-type: none"> ○ Provide iron and folic acid and multi-micronutrient tablets on a regular basis
Social Welfare	
<p>Build on maternal and child cash transfer (MCCT)</p>	<p><u>Evaluate amount of targeted Cash Transfers</u></p> <ul style="list-style-type: none"> ○ Food purchases are often made for the entire household and targeting individuals with 15,000 kyat per month may not be enough ○ Additional support with complementary programming <p><u>Social behavior change communication along with cash transfer</u></p> <ul style="list-style-type: none"> ○ Educate mothers on which foods are nutritious and promote positive food consumption behaviours
<p>Provision of nutritious foods in safety nets</p>	<p><u>Provide nutritious food in social safety net and emergency rations</u></p> <ul style="list-style-type: none"> ○ Fortified rice, using preferred varieties and distributed in affordable formats. Vouchers or mandatory supply of fortified rice in schools, hospitals and MCCT schemes would help. ○ Enabling fresh food purchases along with rice rations, either through cash or voucher
Education	
<p>Leverage education platform to reach children and adolescents</p>	<p><u>Combine targeted with blanket interventions and awareness of nutrition</u></p> <ul style="list-style-type: none"> ○ School meals for all age groups ○ Include micronutrient supplementation based on needs (targeted and/or blanket) ○ Use healthy recipes and meals to improve awareness on nutrition <p><u>Expand on existing school meals with fresh foods</u></p> <ul style="list-style-type: none"> ○ Investigate possibilities of homegrown school feeding models ○ Using the school as a nutritional hub where freshly-cooked meals are provided, fortified rice coming from local producers and local varieties is supplied, fresh vegetables from school gardens are used, SBCC is promoted with the students and their parents <p><u>Connect with other platforms and sectors</u></p> <ul style="list-style-type: none"> ○ Agricultural interventions to connect smallholder farmers and school gardens to school meals ○ Evaluate possibility to target nutrition-specific (health) interventions through schools (e.g. IFA or MMT for adolescent girls) ○ Purchase fortified rice for blanket cereal component in school meals

Agriculture, Public and Private Sector	
Diversify agriculture production	<p><u>Promote diversification to different production channels of nutritious foods</u></p> <ul style="list-style-type: none"> ○ Commercial level (Small and medium enterprises), promote Farmer's Associations and Networks to leverage power on the production side ○ Small-scale household level <ul style="list-style-type: none"> ○ Household gardens to increase diversity of vegetables at household level for self-consumption and to sell small surplus ○ Small-scale livestock, especially poultry for egg productions, supporting government programs for laying hens. ○ Fish pond aquaculture <p><u>Invest in productivity of small-holder farmers</u></p> <ul style="list-style-type: none"> ○ Training farmers on improved techniques, through MoALI's increased extension services ○ Providing inputs: seeds, materials, water <p><u>Realize the benefits from addressing issues related to land rights, land use options and restrictions on limited movement</u></p> <ul style="list-style-type: none"> ○ Expanded access to credit and micro-credit in hard-to-reach areas ○ Increased investment in quality inputs, such as improved livestock breeds and seeds to be available at a subsidized price. Targeting small-scale farmers through private sector, e.g. conditionality on eligibility for subsidies. ○ Support fewer seasonal labour shortages through further knowledge and communication on seasonal labour flows
Improve availability and nutrient content of foods	<p><u>Large-scale rice fortification can be a quick win (if the mixing process is decentralized and adapted to preferred local varieties)</u></p> <ul style="list-style-type: none"> ○ Promote the benefits of rice fortification to consumers ○ Consider the public interest of fortified rice beyond just being a market commodity and support it with mandatory public policies to translate potential for wide health improvement ○ Provide technical support to small- and medium-scale millers in the priority areas to enrich local rice varieties to be able to reach local markets and schools <p><u>Strengthen regulatory environment for food safety and marketing</u></p> <ul style="list-style-type: none"> ○ Advocacy through Sun Business Network
Livelihood Focus	
Target interventions for specific livelihoods	<p><u>Hills and Mountains + Dry Zone</u></p> <ul style="list-style-type: none"> ○ Homestead gardens and small-scale livestock and poultry interventions <p><u>Coastal</u></p> <ul style="list-style-type: none"> ○ Vocational training for off-farm activities to landless people to improve their labor situation, making them less dependent on temporary, unskilled labor. Identify skills that are most in demand in those areas (machineries, hair dressing, tailoring). ○ Homestead gardens, off-shore fishing, on-shore aquaculture and livestock (poultry and pigs) <p><u>Delta</u></p> <ul style="list-style-type: none"> ○ Vocational training for off-farm activities to landless people to improve their labor situation, making them less dependent on temporary, unskilled labor. Identify skills that are most in demand in those areas (machineries, hair dressing, tailoring). ○ Homestead gardens and aquaculture (fish-ponds, fish production in rice fields) <p><u>Urban livelihood zone</u></p> <ul style="list-style-type: none"> ○ Introduce overweight and obesity prevention measures <ul style="list-style-type: none"> ○ Explore sugar tax and food labelling regulations ○ Only allow healthy foods at schools

CONTRIBUTORS

The National Nutrition Centre under the Ministry of Health and Sports in Myanmar; the Fill the Nutrient Gap team at the WFP HQ Nutrition Division, with particular thanks to Neil Mirochnick, Janosch Klemm and Saskia de Pee; the WFP Myanmar Country Office, with particular thanks to Melody Muchimwe, Chaw Su Su Khaing, Shwe Yi Win Lei Aung, Khin Khin Wint Aung; the WFP Regional Bureau Bangkok with particular thanks to James Kingori and Sasha Guyetsky. Donors supporting this analysis are German Federal Ministry of Economic Cooperation and Development (BMZ) and Swiss Agency for Development and Cooperation (SDC).

LIST OF ACRONYMS

BMI	Body Mass Index
BMZ	German Federal Ministry of Economic Cooperation and Development
COTD	Cost of the Diet
CRS	Catholic Relief Services
CSO	Central Statistical Organization
FAO	Food and Agriculture Organization
FFA	Food for Assets
FNG	Fill the Nutrient Gap
HDDS	Household Dietary Diversity Score
HKI	Helen Keller International
HLPE	High Level Panel of Experts on Food Security and Nutrition
MAD	Minimum Acceptable Diet
MDD	Minimum Dietary Diversity
MCCT	Maternal and Child Cash Transfer
MMF	Minimum Meal Frequency
MMFCS	Myanmar Micronutrient and Food Consumption Survey
MoALI	Ministry of Agriculture Livestock and Irrigation
MoE	Ministry of Education
MoHS	Ministry of Health and Sports
MoSWRR	Ministry of Social Welfare Relief and Resettlement
MSN PAN	Multi-Sectoral National Plan of Action for Nutrition
NNC	National Nutrition Centre
SBCC	Social Behaviour Communication Change
SDC	Swiss Agency for Development and Cooperation
UNICEF	United Nations Children's Fund
WHH	Welt Hunger Hilfe
WRA	Women of Reproductive Age

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