UNITED REPUBLIC OF TANZANIA

Ministry of Health, Community Development, Gender, Elderly and Children

National Nutrition Research Priorities July 2018 – June 2023

Reaching all Households with Quality Nutrition

October 2018

MICHIGAN STATE UNIVERSITY

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Foreword

The completion of the development of the National Nutrition Research Priorities (NNRP) sets in a very important milestone in providing guidance and improving coordination of nutrition activities including research work in the country. As stipulated in the National Multisectoral Nutrition Action Plan (NMNAP 2016-21), nutrition research including operation research is key in informing and generating evidence to inform policy and programming decisions.

This is very important especially now, where the country is facing many changes in the field of nutrition in both under and over nutrition; food systems and environment due to population and economic growth, globalization and urbanization; and nutrition multisectoral approaches. All these changes call for a need to have a good work done in research to inform our decisions in forming the nutrition agenda of the country.

With the recognition of the importance of this work, I would like to thank all parties and individuals that took part to provide their technical and financial support to come up with the NNRP 2018-23. Special thanks go to USAID through Michigan State University/ASPIRES Project for their generous technical and financial support that made the process of developing this document possible.

My appreciation also goes to Prof. Joyce Kinabo and Prof. John Msuya for their critical assessment on nutrition research priorities whose inputs were critical in informing the research priorities in this document.

I also wish to acknowledge the technical contributions made by representatives from the Ministry of Health, Community Development, Gender, Elderly and Children; Hubert Kairuki Memorial University, Sokoine University of Agriculture, Tanzania Food and Nutrition Centre, USAID, UNICEF, Ifakara Heath institute, National Institute of Medical Research, IMA World Health, World Bank, CUAMM, PORALG, MUHAS, Ministry of Agriculture, Nutrition International, Jakaya Kikwete Cardiac Institute (JKCI) and Diabetes Association of Tanzania.

It is my hope that we will find this document useful. I therefore encourage both academia and partners in the field of nutrition to pick up one or two topics to research on and share the findings.

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1. Introduction

1.1. Background

Tanzania has made significant progress in reducing malnutrition in the last 25 years with significant reduction in the prevalence of stunting, wasting and underweight among children under five. The prevalence of chronic malnutrition (stunting) among children under five has been reduced from 50% in 1992 to 34% in 2015, while the prevalence of acute malnutrition (wasting) decreased from 8% in 1992 to 4.5% in 2015 (TDHSMIS, 2015-16).

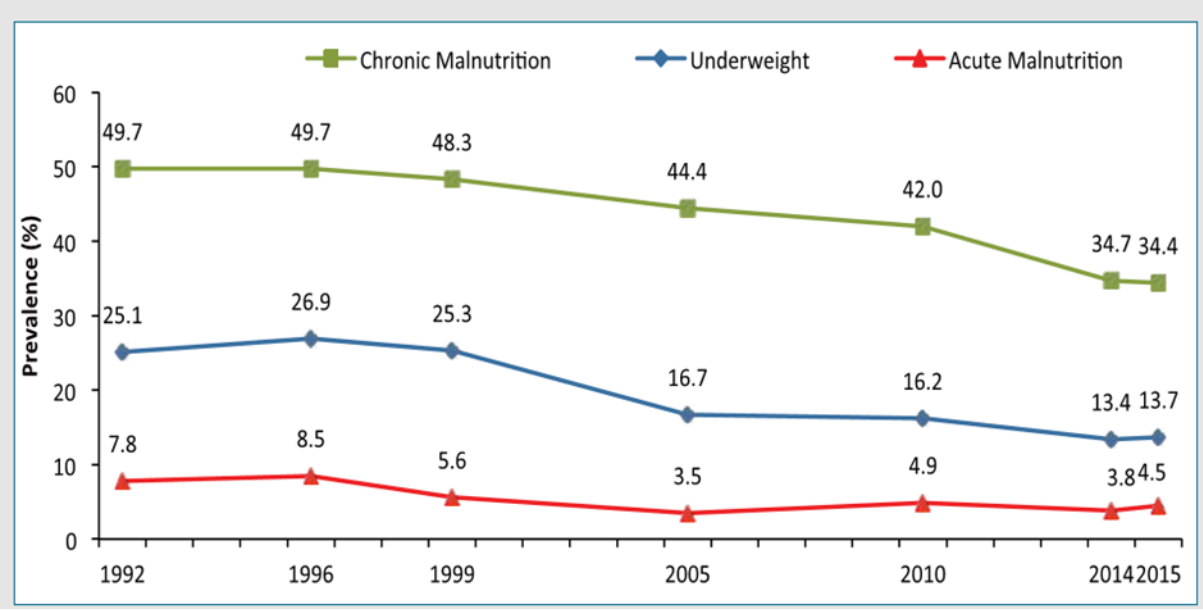


Figure 1: Prevalence trends of stunting, wasting and underweight in children under five years in Tanzania (1992-2015/16)

Source: WHO Global database, TDHS 1992-2015/16, TNNS 2014

Despite this commendable progress, levels of undernutrition remain unacceptably high. The high rate of population growth in Tanzania is outstripping the rate of reduction consequently the absolute numbers of stunted and wasted children are high, and in some instances increasing. In deed , the regional disparities in the number of children affected by stunting has been observed where in the southern highlands, the prevalence of stunting is above 40% (Figue 2). Overall, more than 2.7 million childrenunder five in Tanzania are stunted, which affects their future learning, productivity, and their opportunities to get out of the poverty cycle

In terms of micronutrient deficiencies, a significant improvement has been observed where there is reductions in the prevalence of micronutrient deficiencies. This is exemplified by the 'near elimination' of Iodine Deficiency Disorders (IDD), and a high coverage of Vitamin A Capsule (VAC) supplementation in children. However, improvements in the control of nutritional anaemia (iron and folic acid deficiencies) has been very slow where levels in women and children have remained as high as 45% among women and 59% among children under five.

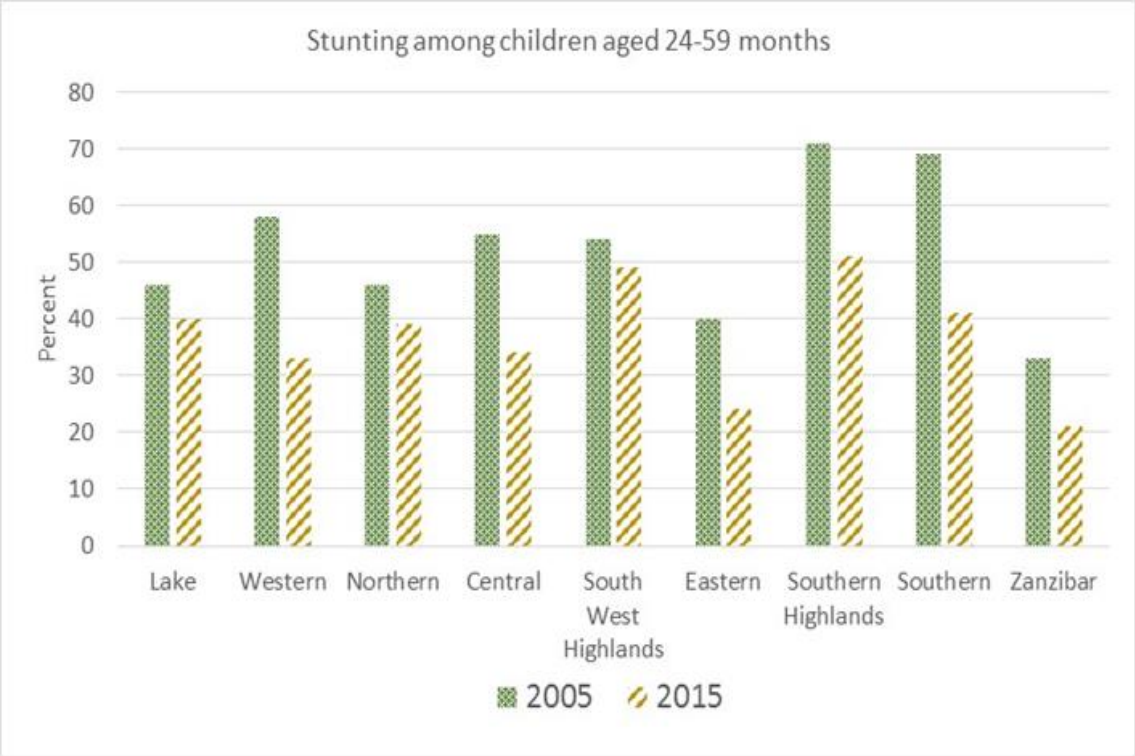
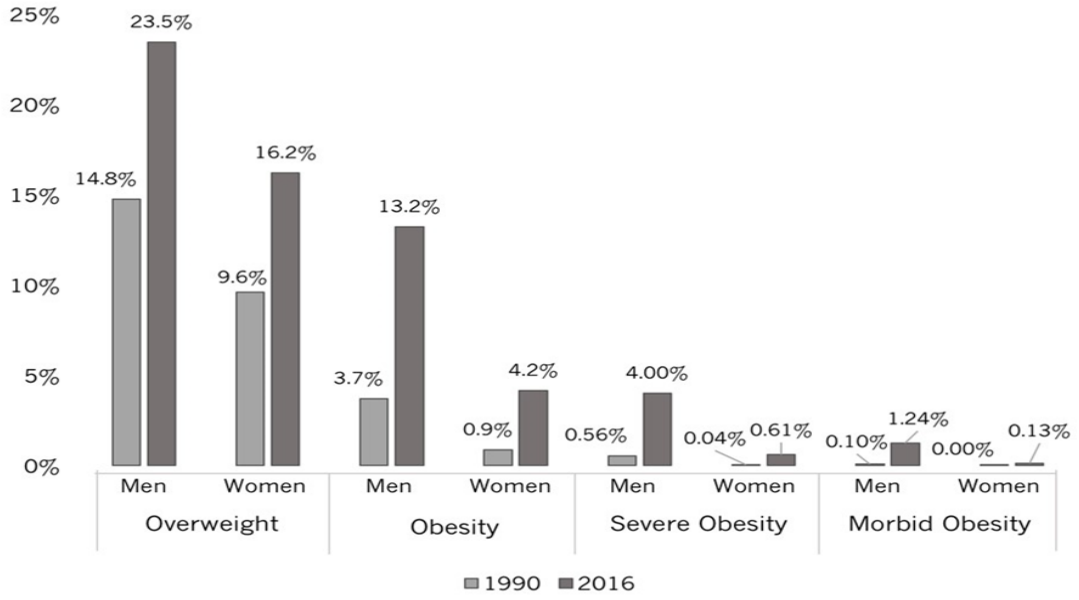


Figure 2: Stunting among children age 24-59 months, Tanzania (2005-2015)

Source: Created by author from IFPRI presentation on Tanzania drivers of stunting (2018)

While the country is still grappling with issues of undernutrition, it is increasingly facing additional challenges related to obesity, overweight and a rise in the prevalence of Diaterly Related Non-Communicable Diseases like diabetes and high blood pressure, especially in urban areas. For example, 3.3 million women (28%) are overweight and obese and 500,000 (4%) children under five years are overweight in Tanzania. Also 1 out of 10 adults in Tanzania has diabetes.



Source: Created by author with data from the NCD Risk Factor Collaboration (2017)

Figure 3: Overweight and Obesity among adult men and women, Tanzania (1990-2016)

As part of renewed commitment in addressing both undernutrition and overnutrition, the Tanzanian government launched a comprehensive five-year National Multi-Sectoral Nutrition Action Plan (NMNAP 2016–2021). To generate evidence required for effective implementation of the NMNAP , research has been given priority under the Nutrition Information System key result area in order to better advance our understanding of the causes of malnutrition which are deeply related to food systems transformations the country is undergoing.

1.2 Food Systems Transformation and Nutritional Outcomes

Developing economies transform at multiple levels in simultaneous and mutually reinforcing ways. Tanzania is now in the midst of that process, with major implications, both positive and negative, for nutrition.

At the broadest level, the **structural transformation** of economies is seen in rapid urbanization, per capita income growth, and the movement of labor off the farm into non-farm activities. This structural transformation stems from and at the same time drives increased incomes in rural and urban areas. As this happens, profound changes take place in a **diet transformation** in the structure of demand for food. Bennett's Law (1954) highlights the move away from staple cereals and roots and tubers as incomes rise, and towards animal-based foods and other fresh foods. Modern researchers (Pingali (1995) for Asia; Tschirley et al. (2015) for Africa; Timmer(2014) for the relation of the diet transformation to the structural transformation) note the very rapid rise in demand, not just for perishable foods, but for

purchased foods in general, for processed foods, and for prepared food consumed away from home. Food becomes more perishable, purchased, processed, and prepared.

As diets change, two things happen again in simultaneous and reinforcing fashion. First, a **food system transformation** unfolds as farmers, traders, processors, retailers, and government adapt to the deep changes in consumer demand. Farms become more engaged in the market and capital intensive, they typically become larger, and value added moves dramatically off the farm, as longer marketing chains, more perishable products, much more processing, greater attention to quality and safety, and eventually far more advertising all capture the lion's share of the consumer price.

Second, all of these forces conspire to drive a **nutrition transition** (Barry Popkin, various) in which over-consumption of calories and of foods rich in fat, salt, and sugar, paired with lifestyle changes featuring less physical activity, lead to rapid rises in overweight and obesity and dietary related non-communicable diseases (DRNCDs). This happens even as under-consumption of calories and micronutrients persists in a (falling) portion of the population. Researchers now speak of the "triple burden of malnutrition" – the simultaneous persistence in a country, and sometimes in the same family, of insufficient calorie consumption, excessive consumption leading to overweight and obesity, and micronutrient deficiencies.[1]

Individual countries always show particular characteristics that differentiate them from each other; this broad patterns outlined above should not be taken to imply uniformity across countries. But these variations across countries are around this broad pattern, which shows-up in extremely robust fashion across countries and over time.

This broad description very much reflects Tanzania's current reality. Rates of child stunting (chronic malnutrition) are high but falling (Figure 1 and Figure 2); overweight and obesity are less prevalent but rising rapidly (Figure 3); and micronutrient deficiencies are widespread.

This nutrition transition is closely related to the food system transformation that the country is undergoing. There is dramatic growth in the number of micro, small and medium enterprises (MSMEs) operating in the off-farm segment of the system, transport, processing, packaging, and retail after the farm. This transformation is from a traditional system dominated by rural production and consumption towards one in which urban areas and markets in both urban and rural areas play rapidly increasing roles in food access.

Currently the country's food system is in a transitional stage, not yet characterized by fully modern patterns of production, marketing, and consumption, but moving rapidly in that direction. Already at this stage one sees rising reliance on food that is purchased, processed, perishable and prepared away from home – the "4 Ps" of food system transformation

As this discussion shows, changes in nutritional status are intimately related to these broader forces of transformation, and most directly to the food system transformation. It follows that the particular nutritional challenges that a country faces, and the approaches that might be most successful in addressing them, also relate closely to the stage of transformation in which a country finds itself (Figure 4).

[1] Indeed, stunting, overweight/obesity, and micronutrient deficiency is not uncommonly found in the same person, a result of biological factors favoring weight gain in response to insufficient energy intake *in utero* and in the first years of life.

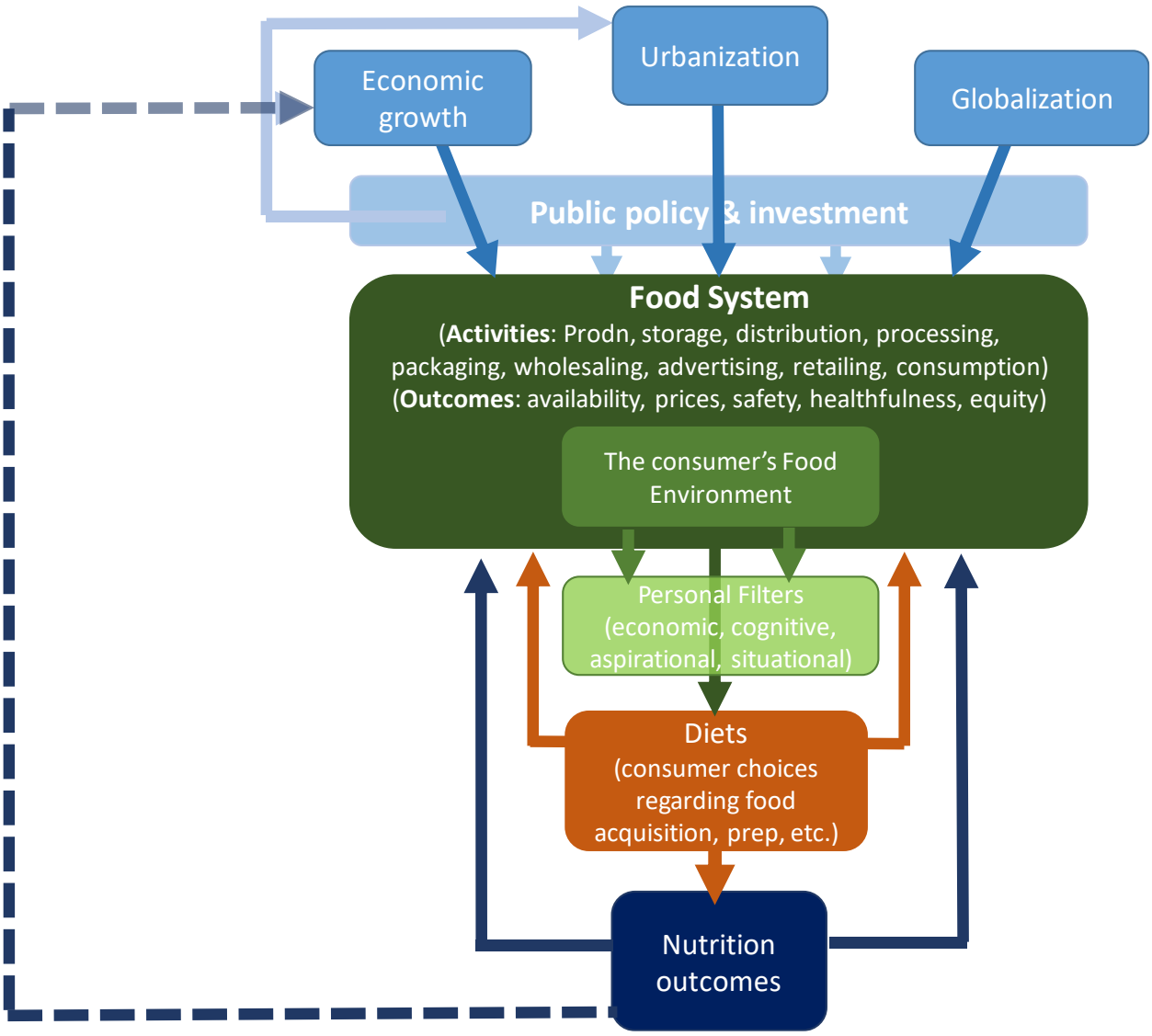


Figure 4: Food Systems and Nutrition

Source: Authors' elaboration

We make several points about the figure above: First, the composition of economic growth (top left major driver) matters, both across sectors and across households. For example, does the country's growth include strong growth in the agricultural sector, and is it shared relatively equitably across low- and high-income households? The particulars of the country's food system transformation and nutrition outcomes will be heavily influenced by such factors.

Second, globalization involves much more than trade. Perhaps of greatest importance is the global flow of information, ideas, values, and aspirations. These can be powerful driving forces shaping what consumers consider to be "desirable" food.

Third, by "food environment" we mean the micro environment in which consumers actually make their food choices - the particular aspects of the larger food system that a consumer actually comes into

contact with. This includes aspects such as the number, type, location and accessibility of food outlets, the availability, cost, quality, and healthfulness of food choices within those outlets, and the kind of food-related messaging that consumers are exposed to as they make their choices.

Fourth, the food environment influences consumer choices through *personal filters* specific to each consumer. These include:

- Economic filters: the consumer's income and purchasing power;
- Cognitive filters: their information and knowledge about food and nutrition
- Aspirational filters: their ideas about what "desirable" food is, which includes aspect of status in addition to taste and other more traditional concepts. A key point here is that food-related advertising can have major impacts – is *designed* to have major impacts - on the consumers' concept of desirable food; and
- Situational filters: the consumer's home and work environment, their mobility, and the amount of time they have to make food choices

Fifth, our approach suggests that two broad types of knowledge are needed if policies and programs and investments are to be made that have the best possible effect on nutritional outcomes. To start, one needs to understand the impact of the fundamental drivers on food system change, on the kinds of (micro) food environments that different consumers face, and on the decisions they make about what kinds of food to eat, how to acquire them, and where to prepare them. With this understanding in hand, one then needs knowledge about how alternative program and policy designs might affect these dynamics and result in improved diets and hence improved nutritional outcomes.

Finally, technical nutrition knowledge needs to feed into both kinds of understanding. For example, how do varying levels of aflatoxin contamination in maize affect the body's response to food intake? Does this vary by gender, or by age, or by health status? Knowing this will help to prioritize food systems research on drivers and levels of aflatoxin infestation and also to prioritize design elements in programmatic interventions to confront the issue.

1.3 Rationale for Development of the National Nutrition Research Agenda

There have been many efforts to develop the nutrition research agenda globally and even regionally. For example, in a survey carried out in 2013/14 to develop a research agenda for Sub-Saharan Africa, participants from Tanzania identified priority areas of focus for nutrition research in Tanzania. These included: (i) Community nutrition research/interventions (ii) Behavioral strategies and (iii) Food security interventions to improve nutrition and prevent malnutrition. Others included: (i) Better governance of nutrition research in terms of funding and allocating a budget for nutrition research within the science and research framework of the country, (ii) Alignment of nutrition research funding with Tanzanian priorities, (iii) Increased capacity development for nutrition research at all levels (human resource and equipment), and (iv) Enhanced information and communication of nutrition research findings to intended users including policy makers.

At country level, TFNC in collaboration with other stakeholders included nutrition research activities in the national research agenda developed by Commission for Science and Technology (COSTECH) (Research Priorities for Tanzania, 2015-2020). The topics identified were food toxicology and food

fortification. The National Multisectoral Nutrition Action Plan (2016-2021) has emphasized the need for rigorous studies based on our local communities to find local solutions for improving nutrition in our context.

However, there have been many nutrition research activities that have been undertaken by various organizations, with different purpose, target group, objectives, methods and geographical coverage. For example, students from high learning nutrition affiliated institutions have been conducting nutrition related research in a variety of nutrition topics. Nutrition programs and projects, have also been undertaking some baseline, operational research and end line studies. This has been the case to a number of researchers in and outside the country. One of the key challenges has been that these research undertakings in most of the time are not informed by the national need on areas that information is needed for improving programming and decision making. As such, their usefulness towards informing such decisions have hardly been noted and therefore remain to be used at individual or program level. This is partly due to inadequate coordination at national level which has been strengthened by the existence of the well-defined NMNAP implementation coordination structure. It is in this context, the national nutrition research agenda has been developed to ensure that various players are informed and guided on national nutrition research priority areas in a more coordinated manner.

1.4 Objectives

. The objectives of this national research priorities are two-fold;

- To provide a coherent overall guidance and approach on nutrition research that will lead to effective policy and program design that drives sustained improvements in nutritional status of Tanzania's population
- To provide a limited number of high priority nutrition issues and illustrative research topics whose understanding is crucial now and over the next five years (2018-2023) for Tanzania to make this kind of progress.

It is therefore important to keep two points in mind. First, the complex nature of nutrition means that many factors are inter-related. As a result, any given piece of research may provide insight and answers to questions that span two or more of the issues laid out. Second, the purpose of the listing of issues, knowledge gaps and potential research priorities is not to fully define what research needs to be done, but to provide clarity in thinking about the challenges that Tanzania faces and to spark concrete ideas on how best to address them. Anyone proposing nutrition research would need to do a more thorough review of the literature in that area to identify the most pertinent knowledge gaps and design the kinds of research best able to fill them.

1.5 The Process of Developing the National Nutrition Research Agenda

The development of the national nutrition research priorities was done in a participatory manner by engaging key stakeholders at different stages (appendix 2). This is consistent with the recommendations of Van Royen, *et. al.* (2013) who argued that "research priorities for Africa need to be identified by African stakeholders, accompanied by consensus building to enable creating a problem-driven national

research priorities. In addition, it was considered necessary to promote interactions among researchers, and between researchers and policymakers." At the initial stage, two independent consultants were engaged. Using their experience, they identified areas of nutrition that need to be researched. Review of reference materials such as NMNAP (2016-2021) and the Research Priorities for Tanzania 2015-2020 prepared by COSTECH was done. A first draft was put together and presented to the stakeholders for their inputs. Their comments and suggestions were then incorporated into the final version. The process was coordinated by TFNC while both technical and financial assistance was provided by ASPIRES which is funded by USAID. The agenda can be updated on annual basis to include new emerging issues that need to be researched on.

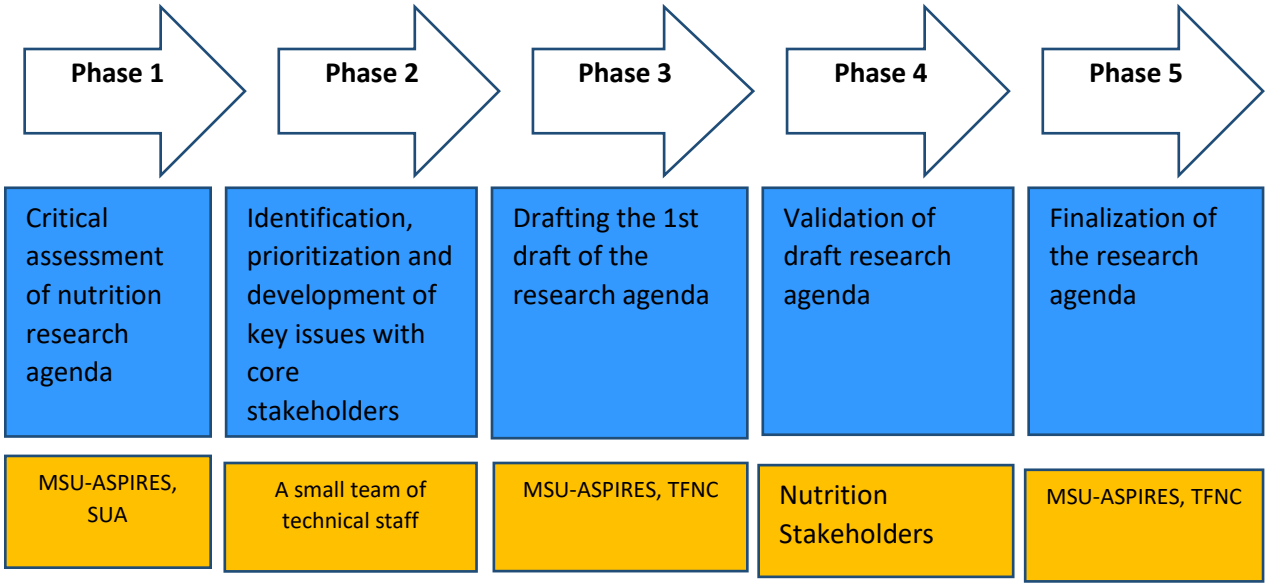


Figure 5: Process of Developing Nutrition Research Agenda

1.6 Target Group

The Tanzania nutrition research priorities target a broad range of stakeholders in the field of health, nutrition and agriculture. This includes academic institutions and their students, programs and projects implementing nutrition interventions, government ministries, departments and agencies as well as individual researchers in and outside the country. The document could also be used by the donors and planners when designing nutrition interventions.

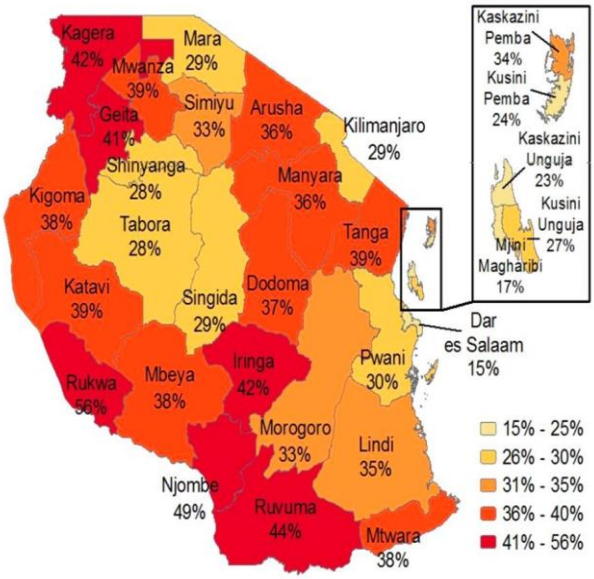
2. Prioritized Research Topics

According to Msuya et al (2015), a number of key research priorities have been identified. The NMNAP (2016-21) has also prioritized operational research to address specific challenge to improve the implementation of the planned activities. This section highlights key issues knowledge gaps within them and potential research topics within the gaps as a result of recent stakeholders' engagement and country priorities

2.1 Issues, Knowledge Gaps and Potential Research Topics

2.1.1 Issue #1: Stunting and wasting: As noted in the background section, rates of stunting and wasting are falling in Tanzania, rapidly in some places, but remain unacceptably high especially in the most agriculturally productive areas of the country: These are four regions all found in the Southern Highlands which are Rukwa, Iringa, Njombe, and Ruvuma (Figure 6).

Figure 6: Rates of stunting in Tanzania, by region (2015)



Source: Demographic and Health Survey and Malaria Indicator Survey, 2015-16

Why is this so? What are the drivers of nutritional outcomes at household level that could lead to such a pattern? Do these drivers vary by rural- and urban areas, and are they different in this area of the country compared to others? Why are boys more affected than girls? These are among the questions that would need to be addressed to fill the knowledge gaps.

The International Food Policy Research Institute (IFPRI) is currently conducting research on the determinants of stunting, using data from the most recent Demographic Health Survey (DHS). The National Panel Survey (NPS) could be used to address more specifically the question of the high rates in Southern Highlands, and more generally the relation between farm level production and nutrition. The NPS has less data than DHS on health conditions that could affect stunting. It does, however, have far more detail on agriculture than does DHS. It also has member-level anthropometry that allows calculation of stunting rates, questions on use of bed nets along with hospitalization and death (separate questions) from malaria (a known contributor to growth faltering in children), at household level, all of which would be important controls in any effort to examine the relation between food production and nutritional outcomes.

DHS provides information on the prevalence of exclusive breast feeding, prevalence of timely initiation of complementary feeding, dietary diversity and minimum acceptable diet. Findings from DHS reveal that there has been very slow improvement with regards to infant and young child feeding practices. A number of research have also been conducted on infant feeding practices and factors associated with inappropriate complementary feeding practices. Nutrition interventions aiming at reducing stunting are now focusing on social behavior change communication activities in addressing the problem of sub

optimal infant feeding practices. Research on effectiveness of social behavioral change approach in improving infant and young child nutrition knowledge and practice are worth investing in.

The problem of aflatoxin contamination crops like groundnuts and maize is increasing and regions with high production of these crops are the one with high stunting prevalence rates. This remains as an unexplored research question as to what extent aflatoxin is a driver of observed stunting outcomes. Medically, it is known that the toxin can contribute to growth faltering. As the major maize producing area of the country (maize is highly susceptible to infestation if not properly dried), might households in this area be more exposed to the toxin than in other areas? And questions on water, sanitation and hygienic practices (WASH), Early Childhood Development (ECD), infant and young feeding practices, and access to health care services need to be answered. Addressing all these issue would require additional data collection, as no household level data set contains information on all these including aflatoxin.

2.1.2 Issue #2: Anemia*:* The DHS shows recent increases in anemia among women and children, even as wasting and stunting have declined. Moreover, rates are lowest in the Southern Highlands, where wasting and stunting are highest. Meanwhile, anemia is also high in some areas with high stunting, such as Kigoma, Shinyanga, Geita, and Mwanza. Sorting out the differential drivers of anemia and stunting could start with analysis of the DHS, which is the only data set that has both anthropometry and indicators of anemia. A lot of research has been done on factors associated with anemia among pregnant women. In addition, few studies have also been conducted on uptake/use of pre-natal folic acid and iron supplementation among pregnantwomen. Key gap in this area include dietary iron availability as well as supply of iron supplementation and folic acid from pre conception, during pregnancy, and even after birth. Also the issue on why the supplementation uptake is very low? what are the factors that triggers anemia for pregnant mothers and children? how could they be addressed? What are the best ways to reach the target groups? What about biofortification?

Any new research should build on results from the IFPRI study, which is expected to be finalized by August, 2018. Depending on what those results show, focused data collection in regions such as Njombe and Iringa (second and fourth highest, respectively in stunting, and first and third lowest in anemia) could be justified. The study should pay careful attention not just to demographic drivers of these problems but also to spatial determinants (degree of urbanicity/rurality of an area); if a significant driver, this could provide important insights for more cost effective targeting of interventions.

2.1.3 Issue #3: Food Safety: Concern about food safety is likely to rise as food system transformation progresses, for several reasons. First, households will increasingly rely on markets for their food, and market infrastructure continues often to be deplorable and contribute to food safety risks. Second, supply chains will become longer as growing cities reach further into rural areas to source their food, increasing the possibility of microbialor other biotic problems (such as aflatoxin) emerging before a product reaches the consumer. Third, consumption of perishable foods, animal products and fresh produce will rise, and these are more susceptible to microbial infection. Fourth, the use of insecticides and herbicides is already rising, and in fact is likely already to be quite high in much of the fresh vegetable production that reaches markets. Insecticides (especially certain types of *organophosphates*) can pose serious health risks for those applying them and for those eating the products to which they've been applied. Fifth, consumers are eatingmore and more processed foods, an increasing share of which contains multiple ingredients whose origin (and even presence) is often not known; some suggest that

the proliferation of MSMEs in the processing sector may pose problems for food safety compared to larger firms that may be more easily regulated and whose visibility may create internal incentives for better practices. Finally, consumption of food prepared outside the home is high and rising quite rapidly in Tanzania (Tschirley et. al. 2015), and the conditions under which this food is sometimes prepared may pose serious risks for food safety. Currently, the use of plastic bags as carriers of hot foods for keeping food fresh is rampant but also the mushrooming complimentary foods.

Very little is known about these issues, about the value chains and locations that might be most problematical, and about differential exposure to these risks across households. Filling this knowledge gap would require new data collection, on targeted value chains and locations. Data would need to be collected at multiple levels of the value chains, from farm to retail, and it would need to combine survey research with careful collection of product samples and laboratory testing of them. This research is not cheap, and requires well equipped laboratory facilities. Its geographical scope and sample size would thus likely be small. This means that the research would need to be very carefully designed, based on careful prior assessments of the particular risks likely to be present in which value chains, and under what conditions (See Schreinemachers and Tipraqsa(2012) for a review of pesticide use in low income countries.)

2.1.4 Issue #4: Overweight, obesity, and diet quality*:* We showed in the background, overweight and obesity are rising rapidly in Tanzania (Kedinget. al., (2012), for research in rural Tanzania relevant to this issue). Diabetes and hypertension are also increasing. These problems will undoubtedly continue to increase as they have in every developing country to date as incomes rise and populations become more urbanized. Both the DHS and the NPS have the anthropometric data needed to investigate this issue in quite some detail, and both should be exploited. The NPS is especially valuable in this regard, as it contains a household food expenditure module that allows relating the issue to diet; as mentioned before, it also has far better data on agricultural production. DHS has a much larger sample size, however, and may have other variables that NPS does not. In both analyses, spatial issues should be carefully assessed.

Neither of these data sets, however, is able to relate changing diets (and nutrition outcomes) to changing food systems in a detailed way, for three reasons. First, neither has information on the food environment that consumers face, which is argued above is a key determinant of diet and thus of nutritional outcomes. The Household Budget Survey (HBS) does have information on retail outlet type, but has no anthropometry data, making it impossible to relate diet to overweight and obesity. Incorporating spatial variables into the NPS and DHS analyses would allow *inferences* on this issue, but would fall far short of the kind of information needed.

Second, the NPS contains a limited set of food consumption items (about 100), which would allow only a very rough estimate of diet quality. Here, the HBS is far better, with over 200 individual food items. Both, however, likely substantially underestimate the consumption of the salty, fatty snack foods and sugar, sweetened beverages that are becoming ubiquitous in urban Africa (Haddad and Webb, 2015). Thus, while matching an appropriate food composition table (FCT) to this dataset could generate better estimates of the average quality of diet at the household level, it would still be missing some of the most problematical foods, the consumption of which may be rising rapidly.

The third problem is that the NPS does not collect member level food consumption or expenditure data, and we have strong reason to believe that food consumption away from home (whether of prepared

foods or ready-to-eat snack foods) varies substantially across members of a household. The consumption of snack foods and sugar-sweetened beverages by adolescents is a special concern that is completely invisible to any existing data sets.

Research is thus needed to directly link the rapid changes taking place in Tanzania's food system – and in the food environments facing consumers - to changes in diets and nutritional outcomes. Doing this will require a research design that links food environment metrics (including spatiality) to consumer knowledge, attitudes, and behavior with respect to food, while also collecting the demographic variables that consumer surveys typically include. Crucially, data on food consumption behavior needs to be collected at the individual level (probably among a subset of household members), not just overall for the household. Such research would enable a far greater understanding of how food environments influence consumer food choices, and would provide a better basis for designing investments and regulatory approaches to improve dietary quality and nutritional outcomes.

2.1.5 Issue #5: Information on program effectiveness: Tanzania like many other countries has not done much on carefully designing and carrying out statistically rigorous evaluation of the impact of its programmatic and policy interventions in the area of nutrition. Such studies require statistically designed target and control groups in order to determine whether an intervention or a policy *caused* a nutritional impact. Without such design, one cannot be certain that any positive change is due to the intervention itself or to other factors that may have changed that had nothing to do with the intervention but that contributed to a positive nutritional change. The lack of such studies is a major knowledge gap in the country.

Design of statistically rigorous impact evaluations (IE)can be challenging for many practical reasons, from ethical (how does one justify withholding a treatment from a group if the treatment is thought to be effective?) to practical (many interventions are not planned with sufficient lead time, or do not have sufficient budgets, to build-in impact evaluation design elements). In practice, generating credible information on the effectiveness of alternative programmatic approaches requires a combination of statistically rigorous IE, where this is possible, and careful independent assessments that might fall short of the full set of formal IE principles but that nonetheless can provide reasonable bases for believing results.

However, the work is done, two issues are worthy of special mention. First, defining the specific programs to be assessed should be done through active consultation with stakeholders from public, private, and civil society sectors. Second, assessments need, whenever feasible, to be repeated some time (2-3 years) after the end of the program, to assess whether any positive effects observed during or immediately after the program were sustained into the future.

2.1.6 Issue #6: Implementation research or the science of implementation is a growing scientific field that will be very useful in enhancing the quality and effectiveness of implementation of the NMNAP. The NMNAP divides proposed interventions into three types: **nutrition specific, nutrition sensitive, and enabling environment interventions** based on their scientific evidence of high impact.Despite abundant evidence of the efficacy of affordable, high impact nutrition interventions, there is little understanding of how to deliver those interventions effectively and at scale in diverse settings and within the wide range of existing systems. While the NMNAP tries to address this challenge

systematically, it is acknowledged that implementation issues may arise as a result of contextual factors that policy-makers, planners and nutrition system managers may not even have considered.

In addition to looking into the factors that determine implementation, implementation research can also look on whether or not the results are indeed due to the interventions themselves. That is why implementation research is also organized on the basis of the theory of change: from desired change (impact)–necessary conditions (outcomes). Even when interventions are designed in similar ways, implementation occurs differently in different contexts, and with many different effects.

Some key implementation research questions that may need answers in the context of the NMNAP could include: How functional and effective are the coordinating structures at the national, regional and Council levels? (Can be measured against their terms of reference); Has the development of human resource capacity and capacity of systems been adequate to implement the NMNAP?What are the challenges and solutions of resource mobilization for the NMNAP?Have the different nutrition sensitive sectors and key development partners aligned their policies, strategies and programmes with the NMNAP?What is the extent of public awareness on nutrition created by the NMNAP?Is the leadership and accountability mechanism of the NMNAP working as envisaged?Is the change in the nutrition situation (at mid-term & end-time) a result of the NMNAP? Are we in the right direction? What challenge that may hinder achieving the set objectives? What could be done better?

3: Operationalization of the National Nutrition Research Agenda

3.1 Capacity Building

Conducting rigorous research and producing empirical findings is very critical in the pursuance of this agenda. Certainly, this is an area that needs capacity building especially on coming up with researchable topics, questions and methods to collect quality data. This also applies to skills on analysis, interpretation and use of the data to inform programming and decision making. All efforts should be done to build the capacity of TFNC and other researchers on these areas. The efforts should be documented and shared with stakeholders by TFNC Research Committee.

3.2 Coordination

The implementation and coordination of researchers and research work will be done by TFNC. TFNC has formed a Research Committee from which its chairperson and secretariat will be responsible to inform, document and archive various undertakings. The chair or the secretariat will update the Nutrition Information System Thematic Working Group on quarterly basis on progress, success and challenge on the course of implementation of the agenda. This also will include mapping information and reporting on who is doing what topic and the geographical coverage using a tool (appendix 1).

The Committee also will ensure that the research agenda is disseminated to all key stakeholders. As needed, the committee might also officially ask a certain institution/program/project to undertake one of the topics based on their merit on this area. For example, academia can play an important role in doing implementation research on NMNAP to help understanding context, performance and areas that need system strengthening. Students doing research for their studies can address many of the implementation questions posed above.

3.3 Dissemination Forums

The TFNC Research Committee will organize forums or collaborate with other forums for sharing and disseminating research findings. This could be in the form of policy dialogue, meetings, conferences and symposium.

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Appendix 1: A Tool to Track Nutrition Research Agenda Implementation

Research topic	Implementing Institution/program	Funding agency	Study Details					
			Study population	Study area	Methodology	Duration	Status	Study hyperlink

Appendix 2: List of Participants at Different Stages of the Agenda Development

S/N	Name	Gender		Position	Institution
1	Adam Hancy		M	Statistician	TFNC
2	Dr.Vincent Assey		M	Ag Managing Director	TFNC
3	Prof.John Msuya		M	Professor	SUA
4	Prof Andrew Swai		M	Professor	Diabetes Association
5	Prof David Nyange		M	Team Lead	MSU/ASPIRES
6	Prof David Tschirley		M	Professor	MSU
7	Dr Godwin Ndosi		M	Associate Professor	HKMU
8	Dr. Festo Kavishe		M	Sen. Managing Director	KICS
9	Geoffrey Chiduo		M	DPP	TFNC
10	Julieth Itatiro	F		Research Officer	TFNC
11	Prof Joyce Kinabo	F	M	Professor	SUA
12	Ramadhani Mwiru		M	Nutrition Officer	UNICEF
13	Margaret Msuya	F		Intern	TFNC/Intern
14	Neema Joshua	F		Senior Research Officer	TFNC
15	Kaiwara Azizi		M	Research Officer	TFNC
16	Francis Millinga		M	Research Officer	TFNC
17	Maria Msangi	F		Senior Research Officer	TFNC
18	Walbert Mgeni		M	Research Officer	TFNC
19	Dr. Kasankala		M	Senior Research Officer	TFNC
20	Sikitu Simon	F		Ag Director,NEDT	TFNC
21	Maria Ngilisho	F		Research Officer	TFNC
22	WaibeMwita		M	Nutritionist	PORALG
23	Dr. Joyceline Kaganda	F		Nutritionist	MOHCDGEC
24	Caroline Kilewo	F		PAO	MoA
25	JacklineMrema	F		Research Officer/Nutrition	IHI
26	Ester Elisaria	F		Chief Researcher	IHI
27	AngellaShija	F		Research Scientist	NIMR
28	Maria Samlongo	F		Nutritionist	JKCI
29	Dr. Bruno Sunguya		M	Director of Research	MUHAS
30	Chiho Suzuki	F		Senior Health Specialist	World Bank
31	TeminaMkumbwa	F		Nutrition Coordinator	USAID
32	Kirk Dearden		M	Senior Adviser/Researcher	IMA World Health
33	Bernard Makene		M	Senior Program Officer	Nutrition International
34	Gulia Segafredo	F		Programme Director	CUAMM
35	Prof Isaac Minde		M	Policy Advisor	MSU/ASPIRES
36	Francis Modaha		M	Food Scientist	TFNC
37	Dr. ElifatioTowo		M	Ag Director, FSD	TFNC
38	Fortunata Chuwa	F		NMES	ASPIRES
39	Tumaini Charles		M	SNS	ASPIRES