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MICRONUTRIENT POLICY PROCESS IN MALAWI

By

Suresh Babu, Steven Haggblade, Elizabeth Mkandawire, Flora Nankhuni, and Sheryl L. Hendriks

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ABSTRACT

Micronutrient deficiencies are common across the developing world and have major effects on the health outcomes of its population. Although this is well understood, many countries find it difficult to bring about policy change in this regard. This paper uses micronutrient policies designed and implemented in Malawi as a case study to shed light on the barriers and gaps faced by developing countries for similar programs and policies. To understand the drivers of policy change, this paper uses the kaleidoscope model to trace the policy processes of three major micronutrients—iodine, vitamin A, and iron. Using a select set of policy process tools, as well as field interviews with key informants who were part of Malawi's micronutrient policy process, the authors test a set of hypotheses on 16 variables that drive policy change in the micronutrient policy sphere.

Results indicate that much of the agenda setting for micronutrient policies and programs was triggered by external events that focused on the elimination of micronutrient deficiencies as part of the global development agenda. These events include the International Conference on Nutrition, the Millennium Development Goals, and, more recently, Scaling up Nutrition. The design of micronutrient policies and program interventions in Malawi was adopted by locally mandated ministries and institutions, in collaboration with development partners who provided both financial and technical support at the design stage. The adoption of micronutrient policies and intervention programs was driven primarily by external funding, particularly through supplementation programs related to vitamin A and iron. Adoption of fortification standards for vitamin A has been going on for more than a decade due to continuous resistance from the private sector, which faces additional costs and needs greater technical expertise. The biofortification method of micronutrient interventions for iron and vitamin A is externally driven and relatively new in Malawi. Although this method is widely accepted by policy makers, no concrete strategy has been developed for its design, adoption, and implementation. Further, supplementation and fortification programs continue to face implementation challenges due to poor physical infrastructure and monitoring systems. However, the national institutional architecture required for agenda setting, design, adoption, implementation, evaluation, and review to address micronutrient deficiencies is in place in Malawi. The system needs continued support from development partners for effective functioning at all levels.

The use of various tools for the policy change part of the kaleidoscope model indicate that policy change is a dynamic process; over time, changes in the nature and composition of the members of policy and institutional architecture can result in different policy outcomes. The Malawi case study demonstrates two things. First, local leadership is crucial in keeping micronutrient deficiencies on the policy-making agenda, and second, it matters where coordinating power is placed in the policy hierarchy. This paper finds that, even with policy champions, adopted policies will face implementation challenges unless they are supported with adequate resources and are systematically followed through to final execution and delivery.

Keywords: micronutrient, policy process, kaleidoscope model, agenda setting

ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
CHISU	Central Health Information Services Unit
CIAT	International Center for Tropical Agriculture
CIMMYT	International Maize and Wheat Improvement Center
CIP	Central Potato Research Institute
CLAN	Community Leader for Action on Nutrition
CMAM	Community Management of Acute Malnutrition
CSONA	Civil Society Organization Nutrition Alliance
DARS	Department of Agricultural Research Services
DFID	Department for International Development
DHS	demographic health survey
DNHA	Department of Nutrition, HIV, and AIDS
ECSA	East and Central Africa
FAO	Food and Agriculture Organization of the United Nations
FHO	Food Hygiene Officer
FSNU	Food Security and Nutrition Unit
FSP	Food Security Policy
FTLG	Food Fortification Logo Guidelines
GoM	Government of Malawi
HIV	Human Immunodeficiency Virus Infection
ICCIDD	International Council for Control of Iodine Deficiency Disorders
ICN	International Conference on Nutrition
IDA	iron deficiency anemia
IDD	iodine deficiency disorder
IDD	iodine deficiency disorder
IFPRI	International Food Policy Research Institute
IYCF	infant and young child feeding
LUANAR	Lilongwe University of Agriculture and Natural Resources
LUNAR	Lilongwe University of Agriculture and Natural Resources
MBS	Malawi Bureau of Standards
MDD	minimum dietary diversity
MDG	Millennium Development Goal
MEPD	Ministry of Economic Planning and Development
MGDS	Malawi Growth and Development Strategy
MICAH	Micronutrient and Health Program
MoA	Ministry of Agriculture
MoAIWD	Ministry of Agriculture, Irrigation, and Water Development
MoEST	Ministry of Education, Science, and Technology
MoG	Ministry of Gender, Children, Disability and Social Welfare
MoGCDSW	Ministry of Gender, Children, Disability, and Social Welfare
MoH	Ministry of Health
MoIT	Ministry of Industry and Trade
NECS	Nutrition Education and Communication Strategy
NFA	National Fortification Alliance
NGO	Nongovernmental Organization

NMS	National Micronutrient Strategy
NNP	National Nutrition Policy
NNPSP	National Nutrition Policy and Strategic Plan
NNSP	National Nutrition Strategic Plan
NPAN	National Plan of Action in Nutrition
NSO	National Statistical Office
OFSP	orange-flesh sweet potato
OPC	Office of the President and the Cabinet
PABRA	Pan-African Bean Research Alliance
PHO	port health officer
PS	principal secretary
SHN	School Health and Nutrition
SUN	Scaling Up Nutrition
UNICEF	The United Nations Children's Fund
UNIMA	University of Malawi
USAID	United States Agency for International Development
VAD	vitamin a deficiency
WFP	World Food Program
WHO	World Health Organization

Contents

Tables

Figures

Boxes

1. INTRODUCTION

The nutritional well-being of a population is at the top of the policy agenda at the national and global level, both as an input to human development and as an outcome of economic growth (United Nations 2015). However, developing countries that have designed and implemented nutrition policies and programs vary in their motivation, approach, and outcomes, in part because translation of global objectives at the national level differs in terms of policy articulation, strategy development, program design, resource allocation, and final nutritional input. Understanding these differences and learning what works and why in the nutrition policy process at the national level can help strengthen the policy system toward effectively achieving development goals. This paper is one part of a set of case studies conducted under the Food Security Policy Innovation Lab[1] (FSP 2015) that compares the micronutrient policy-making process in Malawi, South Africa, and Zambia.

The primary objective of the case study is to develop a complete understanding of the challenges and constraints that reduce the effectiveness of policy systems in developing countries. To achieve this objective, the Malawi case study undertakes two broad sets of activities. In line with the broader framework developed for the policy process case studies, it will do the following:

1. Develop a map of the institutions involved in Malawi's nutrition policy process. This activity will identify key actors and players in the nutrition policy process, their organizational objectives, and the roles they play in the policy process. It involves understanding their interaction toward achieving nutrition goals in Malawi. Further, the dynamic nature and conduct of the organizations is studied to explore their relative importance over time and to understand how such dynamic changes influence nutritional policy outcomes.
2. Provide an assessment of the factors contributing to micronutrient policy development in Malawi. This paper considers policies related to three major micronutrients—vitamin A, iron, and iodine. For each of these micronutrients, various strategies are identified in order to understand the motivation of leadership, issues in policy design, and policy adoption challenges, including opposition, implementation, monitoring and evaluation, and refinement.

This case study uses a framework developed by Resnick et al. (2015) to study the process of policy change. The framework is based on a review of a wide range of policy process models studied in policy science, political economy, and pubic administration literature. We use this framework to develop specific hypotheses that are testable using information collected from field interviews with key policy actors and players.

The next section of this paper presents an overview of the micronutrient challenges facing Malawi and the policy measures taken to overcome them. Section 3 describes the methodology used in analyzing the case study and data collection. Section 4 presents a set of key hypotheses on micronutrient policy changes in Malawi. Finally, Section 5 presents the implications of the results and conclusion.

[1] The FSP partner institutions include Michigan State University, the International Food Policy Research Institute, and the University of Pretoria.

2. MICRONUTRIENT POLICIES AND POLICY PROCESSES IN MALAWI

Major Micronutrient Challenges

Since Malawi's first nutrition study (the Nyasaland Nutrition Study), the nation's nutrition-related policies have evolved in various forms and intensity. However, in the context of policy and program formulation, micronutrient deficiencies were only seriously recognized in the early 1990s, during the Food and Agriculture Organization's (FAO's) International Conference on Nutrition (ICN1) discussions and the national development policy discussions. At that time, deficiencies in micronutrients such as vitamin A, iron, and iodine were identified as serious problems in Malawi. In addition, in the early 1990s, UNICEF took leadership in iodine salt fortification, and FAO implemented projects that used home gardens to address the problems of micronutrient malnutrition. Since then, several policy documents continue to discuss micronutrient policies and programs. The fortification of foods—both fortification of processed foods and biofortification—has become a key policy intervention in recent years. UNICEF's global Multiple Indicator Cluster Survey, conducted in 2009, also highlights the challenges of micronutrient deficiencies and reinforces the policy focus on micronutrients.

Goals

In the context of Malawi, the case study has two interrelated objectives. First, it looks at the broad nutrition policy process in Malawi and maps out the institutions involved. The authors study the institutional interactions that enable the process of policy change with respect to nutrition and micronutrients. They also investigate Malawi's institutional architecture and its influence on micronutrient policies and their outcomes.

Second, this case study applies the kaleidoscope model to assess the drivers of change related to micronutrient policies. In Malawi, some of the micronutrient fortification policies have recently become mandatory, while others are implemented as voluntary interventions. The authors identify the actors and players who supported or opposed each policy development in order to study the mechanisms through which micronutrient interventions became part of the policy agenda. They also look at the process of micronutrient policy implementation and regulatory policies that drives the agenda setting, design, adoption, implementation, and monitoring and evaluation of the micronutrient policy intervention.

History of Micronutrient Deficiencies and Intervention Programs

Malawi has largely kept pace with global developments in the fight against micronutrient deficiencies, particularly, in raising the issue to the national level. In the early 1990s, three global events set the stage for Malawi's national level discussions: the World Summit for Children (1990), the Policy Conference on Hidden Hunger (1991), and the International Conference on Nutrition (1992). Participants from Malawi attended the first and the third event. The second event was a broader technical consultation held primarily to clarify the technical issues and shared experiences in developing countries, with a particular focus on Asia (ICCIDD 1991).

While micronutrient policies and programs have evolved over the years in Malawi, major challenges in micronutrient deficiencies still exist. This paper highlights the areas in which more effort is needed in this regard. Table 2.1 presents comparative information on micronutrient deficiencies in Malawi for two periods. As the table shows, the percentage of households in Malawi with nutritional intake is below requirements. The numbers are disaggregated by rural and urban households for 2004/2005 and 2010/2011. The data indicate that the shortfall in calorie intake has gone down by 5.0 percent for the entire country, with the decline more prevalent in urban areas (10.3 percent) than in rural areas (3.8 percent). About 34.0 percent of Malawian households continue to face food insecurity in terms of calorie requirement. For micronutrients such as iron and vitamin A, Malawi continues to face remarkable challenges. There has been an increase in the share of rural households whose intake of iron is

below the required norm. Urban households show a slight reduction with respect to iron deficiencies during these two periods. The share of households failing to meet the vitamin A requirement has increased for both rural and urban households, with the national average close to 70.0 percent. Thus, micronutrient policies continue to be on the national nutritional policy agenda. Additional information on the prevalence of micronutrient deficiencies was also published after the national micronutrient surveys; AppendixTables A.2 and A.3 provide a comparison of the results between the two surveys and the methods of assessing the deficiency levels.

Table 2.1 Estimated shortfalls in calorie, iron, and vitamin A consumption, by residence, 2004/2005 and 2010/2011

	Calorie shortfall (%)			Iron shortfall (%)			Vitamin A shortfall (%)		
	2004/ 2005	**2010/ 2011**	***% change***	**2004/ 2005**	**2010/ 2011**	***% change***	**2004/ 2005**	**2010/ 2011**	***% change***
Total	**39.4**	**34.3**	***–5.1***	**44.1**	**48.6**	***4.5***	**62.0**	**69.9**	*7.9*
Rural	40.5	36.7	*–3.8*	42.6	47.7	*5.1*	61.8	69.8	*8.0*
Urban	30.9	20.6	*–10.3*	55.1	54.0	*–1.1*	63.1	70.8	*7.7*

Source: Pauw et al. (2015), based on data from integrated household surveys (NSO 2005, 2012).
Notes: NSO: National Statistical Office.

As Table 2.1 shows, the reach of micronutrients in rural areas is limited. Further, awareness of micronutrient consumption is also low in Malawi, making this an important nutrition issue for the nation to tackle. Table 2.2 gives a snapshot of the micronutrient issue in Malawi based on the latest available National Micronutrient Survey Report (2009) results. According to this table, vitamin A deficiency and iron deficiency are serious causes of concern in the country, particularly among children under 5 years of age. Even though, according to the Demographic Health Survey for 2015–2016 (USAID 2016), stunting is down by 10 percent, from 47 to 37 percent, Malawi has a long way to go in reducing micronutrient deficiencies.

Table 2.2 Micronutrient situation in Malawi, 2009

Micronutrients/ Prevalence among vulnerable groups	**Children under 5 years**	**School-aged children**	**Nonpregnant women of reproductive age**	**Men**
Vitamin A deficiency (serum retinol)*	22.0%	8.5%	1.6%	0.2%
Mildly vitamin A deficient	73.2%	56.3%	12.0%	1.6%
Anemia	55% (Hb less than 11.0 g/dL)	25% (Hb less than 11.5 g/dL)	32% (Hb less than 12.0 g/dL)	12% (Hb less than 13.0 g/dL)
Iron deficiency (transferrin receptors)**	51%	30%	27%	7%
Iodine (urinary excretion)***	N/A	27%	26%	N/A

Source: National Micronutrient Survey Report (2009).
Notes: * Serum retinol values below 20 ug/dL. ** Iron deficiency anemia assessed by combining hemoglobin with transferring receptors: under-5 children, 31%; school-aged children, 12%; nonpregnant women, 9%; and men 9%. *** Percentage below World Health Organization–recommended population median excretion level (WHO cut-off is less than 100 for median level). N/A = not available.

Table 2.3 provides an overview of the micronutrient intervention programs and their delivery mechanisms currently implemented in Malawi. Salt iodization is the time-tested intervention for iodine deficiency disorders (IDDs). Since 1999, all salt sold and consumed in Malawi must be iodized, by law. Thus, the entire population is covered under this intervention. Pregnant women and adolescent girls are the most vulnerable segment of the population in terms of iron deficiency. The government gives iron

folate through antenatal clinics and schools. Implementation of this program, however, suffers from low coverage, as only pregnant women who have access to an antenatal clinic are covered.

Table 2.3 Overview of micronutrient policy and program interventions in Malawi

No.	Micronutrient	Target	Delivery mechanism		
			Supplements	Fortification	Biofortification
1	Vitamin A	Children 6–59 months	Distributed biannually through Child Health Days	Wheat flour, maize meal, corn-soya blend, sugar, and oil	Orange-flesh sweet potato; maize
		Postpartum women	✓		
		Entire population		✓	✓
2	Iron folate	Pregnant women	Provided through antenatal care but suffers compliance challenges		
		Adolescent girls (10–19 years)	Distributed in schools as school health and nutrition program		
3	Iron	Preschool children under 5 years; pregnant women	✓		
		General public			Beans
4	Iodine	General public		Salt	
5	Zinc	Children with diarrhea	✓		
6	Vitamin-mineral multimix (iron, vitamin A, folic acid, zinc)			Likuni Phala, maize and wheat flour, ready-to-use therapeutic foods	
7	Micronutrient powders (sprinkles)			Forthcoming in 2015 (will be distributed in clinics to mothers of children with identified problems)	

Source: Authors compilation.

For vitamin A deficiencies (VADs), three approaches are in place in Malawi—supplementation, fortification of processed foods, and biofortification. Vitamin A capsules are distributed to children under 5 years and postpartum women through the Child Health Days, which are organized throughout the country twice a year to provide affordable healthcare to children and women. In addition, the fortification of processed food is another major intervention for addressing VAD. Sugar and oil are currently fortified with vitamin A in the country. With regard to biofortification, farmers are beginning to grow orange-flesh sweet potatoes (OFSPs). Although this intervention has promising benefits, more work needs to be done to increase the adoption of such varieties.

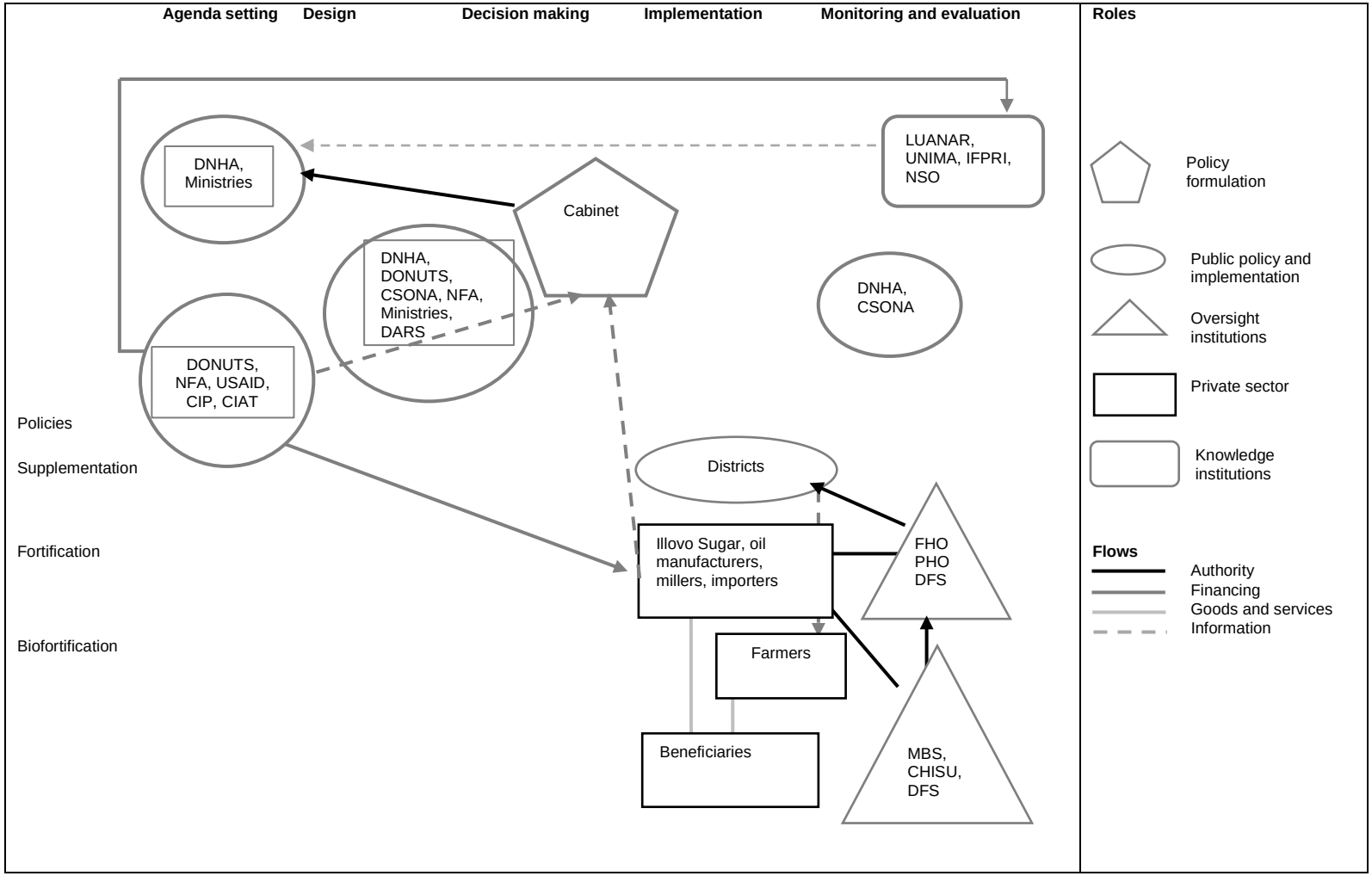
In addition, multivitamin mixes containing iron, vitamin A, folic acid, and zinc are given to children through health centers. Plans are also underway to distribute micronutrient powders through health clinics to address specific micronutrient deficiencies. In the context of this study, we focus on the supplementation, fortification, and biofortification interventions for iodine, vitamin A, and iron.

Key Nutrition Policy Institutions and Policy Processes in Malawi

This section describes the nutrition policy system, including the role of various actors and players from the public, private, nongovernmental organization (NGO), and development sectors. Understanding their

relations and how they come together to address nutrition policy issues in Malawi has implications for the specific micronutrient policy processes analyzed in the next section. Figure 2.1 shows the stakeholder mapping for nutrition programming and policy making. Until 2014, the Office of the President and the Cabinet (OPC) was responsible for the nation's nutrition policy design and implementation. The Department of Nutrition, HIV, and AIDS (DNHA) was housed under OPC and reported directly to the president. Six major ministries (sectors) that had key nutrition functions and that reported to DNHA in OPC are now supposed to report to DNHA in the Ministry of Health (MoH). This change is creating issues related to mandate and compliance of sectoral ministries to their nutrition mandates and challenges in making them accountable. This situation is discussed further below.

Figure 2.1 Stakeholder mapping for nutrition policy and programming



Source: Authors' field interviews.

Notes: DNHA: Department of Nutrition, HIV, and AIDS; DONUTS: Donors Nutrition Network; NFA: National Fortification Alliance; CSONA: Civil Society Organization Nutrition Alliance; LUANAR: Lilongwe University of Agriculture and Natural Resources; UNIMA: University of Malawi; IFPRI: International Food Policy Research Institute; NSO: National Statistical Office; MBS: Malawi Bureau of Standards; CHIU: Central Health Information Unit; FHO: Food Hygiene Officer; PHO: Port Health Officer; DARS: Department of Agricultural Research Services; CIAT: International Center for Tropical Agriculture ; USAID: US Agency for International Development.

All six ministries operate and implement nutrition programs at the national and district levels, following their own respective mandates. For example, the Ministry of Education operates the school nutrition programs at the district level, whereas the Ministry of Gender, Children, Disability, and Social Welfare implements programs through community development officers located in the districts. The Ministry of Agriculture, Irrigation, and Water Development works through its food and nutrition offices, which are deployed in the Agricultural Development Divisions. The deputy directors of nutrition in the sectoral ministries are the focal points for nutrition at the national level. A similar setup exists at the district level, where the officers responsible for food and nutrition come together at the district level under the district commissioner for program implementation. Further, the Scaling Up Nutrition (SUN) movement provides implementation of nutrition programs that extend to community and household levels.

Three committees oversee nutrition policy making in Malawi. First, the Parliamentary Committee on Nutrition helps in the budgetary allocation for nutrition and holds the government accountable for the nutrition outcomes. However, according to the Civil Society Organization Nutrition Alliance (CSONA; personal interview), this committee is not fully equipped with information on nutrition policies and programs and how these policies yield results on the ground. Second, the Cabinet Committee on Nutrition brings together the ministers with nutrition mandates to guide the policy process. Finally, the Principal Secretaries (PS) Committee on Nutrition reports to the cabinet committee and is responsible for nutrition programming and outcomes.

The key NGOs operating in the nutrition sphere in Malawi include CSONA (the network of civil society organizations operating in nutrition), Catholic Relief Services, Concern International, World Vision International, Save the Children, and the Clinton Health Access Initiative. These organizations are also members of the National Nutrition Taskforce, which brings together various actors and players from the public, private, and NGO sectors. The National Fortification Alliance (NFA)—a group of actors including the government, private sector, and NGOs—is specifically responsible for developing and monitoring fortification activities in Malawi.

A multitude of international agencies and donors are active in the Malawian nutrition policy scene. They include UN agencies such as UNICEF, FAO, and the World Food Programme (WFP). Multilateral and bilateral agencies include the World Bank, EU, USAID, Department for International Development (DFID), and Irish Aid. In addition, both local and international research institutions conduct research on nutrition-related issues. These include the National Research System of Malawi; local universities such as Lilongwe University of Agriculture and Natural Resources (LUANAR) and the University of Malawi; and international research centers, such as Centro Internacional de Agricultura Tropical (CIAT), International Institute of Tropical Agriculture, International Food Policy Research Institute (IFPRI), International Crops Research Institute for the Semi-Arid Tropics, and International Maize and Wheat Improvement Center (CIMMYT). Recently, the SUN initiative recognized Malawi as an "Early Riser"[2] and helped bring together donors and national entities for better coordination of nutrition intervention programs. Table 2.4 presents the corresponding institutional architecture for the coordination and implementation of interventions. Figure 2.2 presents a diagrammatic representation of the institutional architecture for how Malawi's nutrition policy process works.

[2] Early Riser countries under SUN are those that have shown high political commitment and that have the potential to address nutritional challenges.

Table 2.4 Institutional architecture for nutrition coordination in Malawi

NATIONAL	**Role**	**Coordination committees**	**→ Department of Nutrition, HIV, and AIDS (DNHA)** **→ Principal secretaries (PS) * Director * Deputy director * Several officers for nutrition * Several officers for HIV**				
	Key nutrition sector leaders	**→ National Nutrition Committee** **→ 5 technical working groups**	**Ministry of Local Government and Rural Development**	**Ministry of Agriculture, Irrigation, and Water Development (MoAIWD)**	**Ministry of Health** *(DNHA moved here in 2014.)*	**Ministry of Education, Science, and Technology**	**Ministry of Gender, Children, Disability, and Social Welfare**
			→ Deputy Director of Nutrition Felix Pensulo Phiri	**→ DAES: Deputy director of food and nutrition** **→ DAES: 3 FNOs** **→ MoAIWD: Deputy director of nutrition, HIV, and AIDS**	**→ Clinical services deputy director (nutrition)** **→ Clinical: 3 nutritionists**	**→ SHN deputy director** **→ SHN: 2 nutritionists**	**Deputy director of nutrition; Mary Shawa is the current PS**
	Regional	• N/A		**8 Agricultural Development Divisions** **→ FNO**	5 Health Zones • Zonal supervisor	6 Education Divisions • SHN focal point	
DISTRICT	**Key nutrition sector officers**	• District Executive Committee **→ District Nutrition Coordination Committee** • District Agricultural Extension Committee	• District commissioner • Director of planning and development **→ District nutrition officer**	• District agricultural development officer **→ FNO** • Extension methodology • Crops officer • Livestock officer	• District health officer **→ Nutritionist** • Nursing, maternal, and child health • Environmental health	• District education manager • SHN coordinator	• Social welfare officer • Community development officer • Asst. social welfare • Asst. district social welfare
AREA	**Extension supervisors**	• Area Development Committee • Area Stakeholder Panel (agriculture)	• Traditional authority • Group village heads	• Agricultural extension development coordinator • **FNO**	• Asst. environmental health • Clinical officers • Medical assistants • Nurses • Senior HSAs	• Primary education adviser	• Social welfare assistant • Zone supervisors

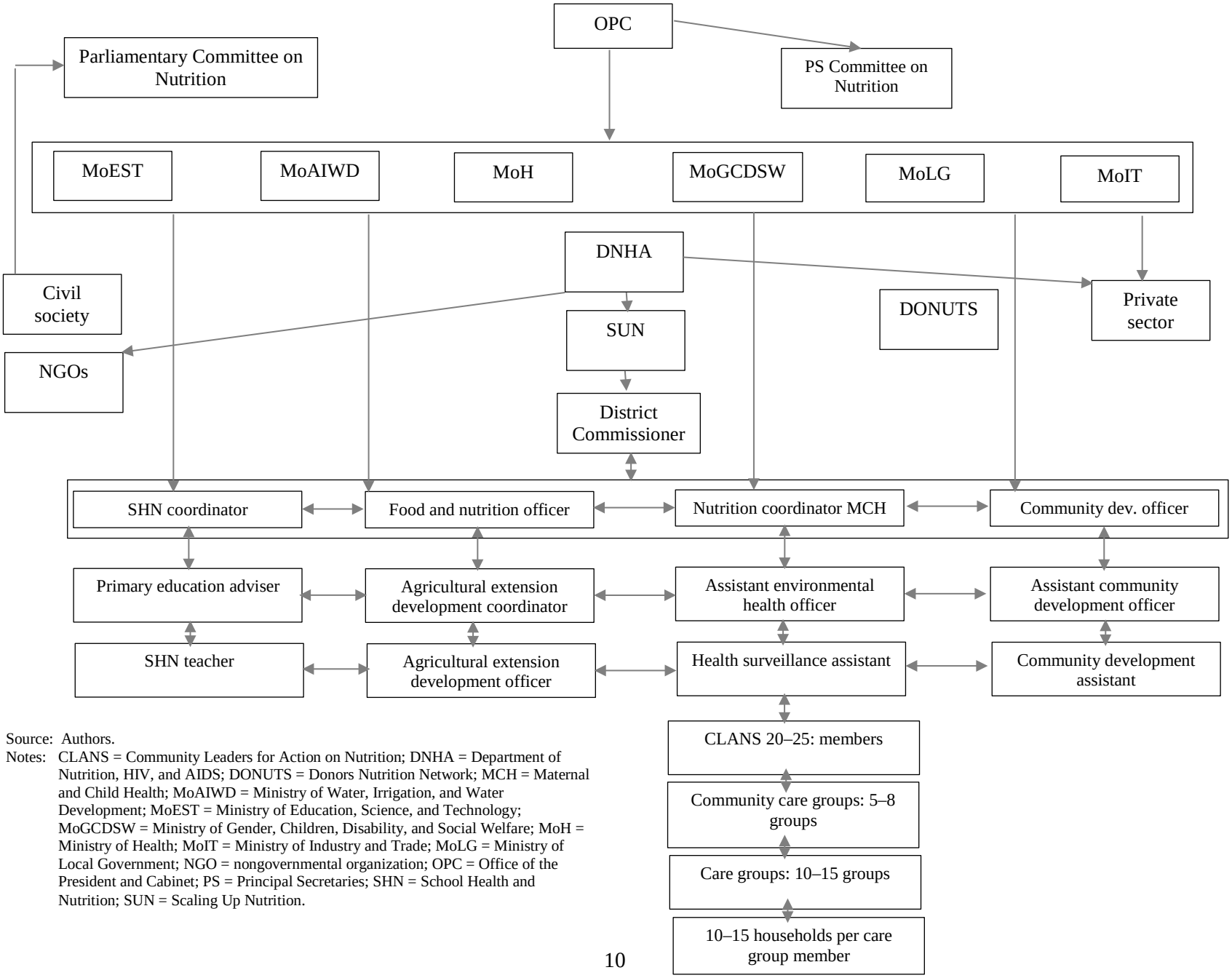
Table 2.4 Continued

	Role	**Coordination committees**	→ **Department of Nutrition, HIV, and AIDS (DNHA)** → **Principal secretaries (PS) * Director * Deputy director * Several officers for nutrition * Several officers for HIV**				
COMMUNITY	**Frontline workers**	• Village Development Committee → **Community Leaders for Action on Nutrition** • Village Stakeholder Panel (agriculture) • Village Health Committee	• Village heads → **Community nutrition and HIV workers**	• Agriculture Extension Development Officer	• HSAs	• Teacher	• Community Development Assistant
	Community volunteers			• Lead farmers (for many different subjects, including nutrition)	• Community health • Growth monitoring • Community management of acute malnutrition	• Parent Teacher Association • School Management Committee	• Community-based organizations • Community-based childcare centers
	Community members	→ **Community Care Group**	**Households**				

Source: Prepared using information from interviewees.

Notes: DAES = Department of Agricultural Extension Services; FNO = Food and Nutrition Officer; SHN = School Health and Nutrition; HSA = Health Surveillance Assistant; MoAIWD = Ministry of Water, Irrigation, and Water Development; N/A = not available.

Figure 2.2 Institutional architecture of nutrition coordination in policy process of Malawi



Source: Authors.

Notes: CLANS = Community Leaders for Action on Nutrition; DNHA = Department of Nutrition, HIV, and AIDS; DONUTS = Donors Nutrition Network; MCH = Maternal and Child Health; MoAIWD = Ministry of Water, Irrigation, and Water Development; MoEST = Ministry of Education, Science, and Technology; MoGCDSW = Ministry of Gender, Children, Disability, and Social Welfare; MoH = Ministry of Health; MoIT = Ministry of Industry and Trade; MoLG = Ministry of Local Government; NGO = nongovernmental organization; OPC = Office of the President and Cabinet; PS = Principal Secretaries; SHN = School Health and Nutrition; SUN = Scaling Up Nutrition.

Brief History of Nutrition Policy Making in Malawi

In the past three decades, nutrition as a policy theme has moved up and down in policy makers' recognition of it as a national priority. In the mid-1980s, right after the first PS symposium on nutrition convened by UNICEF and the Centre for Social Research, nutrition became a national development priority, leading to the development of a National Nutrition Plan. The nutrition problems were explicitly documented for the first time, and district-wise maps of various forms of malnutrition were presented. The alarming rates of malnutrition were recognized as a national development challenge for Malawi. In addition, a special unit called the Food Security and Nutrition Unit (FSNU) was formed in 1986 to coordinate the food security and nutrition activities of various ministries in the Ministry of Economic Planning and Development. FSNU was effective in coordinating and maintaining an overview of policies and programs and functioned as a knowledge hub for food security and nutrition-related information. Further, it led to discussions on policy solutions for food security and nutrition issues (personal interview).

In 2000, however, the president dissolved this unit as part of restructuring the MEPD, as the local capacity to run FSNU was low, and nutrition issues were overshadowed by urgent priority issues, such as HIV and AIDS. In the mid-2000s, however, nutrition and HIV/AIDS were treated as a priority jointly, because the interrelationship between them was recognized. To fill the coordination gap left by FSNU, the Food Security and Nutrition Policy of 2004 recommended the re-establishment of a national council for food and nutrition security in the OPC for policy coordination and implementation. Initially, it was proposed that the nation's vice president would chair the council and would report to the Cabinet Committee on Food and Nutrition. However, this did not materialize, as there was a need for a more permanent functional unit that would combine the dual challenges of nutrition and HIV/AIDS. To meet this need, the DNHA was formed under the MoH in 2001. However, in 2004, this department was relocated and placed directly under the supervision of the Office of the President. The champion of this transition was Dr. Mary Shawa, the current principal secretary in the Ministry of Gender, Children, Disability, and Social Welfare. Shawa's work increased attention for both nutrition and HIV/AIDS. In 2014, however, as part of ongoing public-sector reforms targeted at moving special initiatives of the OPC back to sectoral ministries, DNHA was moved back to the MoH. Table 2.5 gives a detailed chronology of actions, actors, and triggering events related to micronutrient policy and program intervention. This information is further elaborated upon in Section 4.

Table 2.5 Micronutrient policy chronology for Malawi

Date	Actors	Actions	Triggering events
1939/1940		First longitudinal food and nutrition study	
1960	Unilever	Voluntary oil fortification	Marketing strategy, gaining market share
1968–1970		Ad hoc nutrition surveys (Burgess and Wheeler 1970)	High prevalence of malnutrition
1972	Government of Malawi (GoM) / Malawi Bureau of Standards (MBS)	Malawi Bureau of Standards Act 1972	
1972	GoM/MBS	Fortification Legislation under MBS Act	
1974	Freedom from hunger campaign nutrition team / GoM	Nutrition units in MoA, Ministry of Health (MoH), MoG, and Ministry of Education established and interministerial food and nutrition committee (National Nutrition Committee) / Human nutrition started to be taught to agriculture students	Widespread under nutrition recognized
1983	Research community	Xerophthalmia study in Chikwawa and Ntcheu districts showed high levels of malnutrition problems	

Table 2.5 Continued

Date	Actors	Actions	Triggering events
1985	Rab Processors Ltd.	Development of Sunshine Likuni Phala by Rab Processors (multimix including vitamin A)	Missionaries' fortification strategies adopted by Rab Processors
1986	GoM / UNICEF / Catholic Relief Services	First National Nutrition Symposium for Principal Secretaries	Regional UNICEF office recognized high levels of malnutrition and started communicating
1986	GoM/UNICEF	Establishment of food security and nutrition unit	National Nutrition Symposium recommends a nutrition coordination unit at the national level
1989	MBS	Fortification guidelines developed for various foods, including salt	FAO codex alimentarius
1990	GoM/FSNU/UNICEF/USAID	Food security and nutrition policy statement; an addendum to the national development policy	Presence of the nutritionist in the FSNU helps bring food security and nutrition issues to the national development policy levels
1990	MoH/UNICEF	Vitamin A supplementation begins (no exact dates found)	
1992	GoM/UNICEF	Full participation in International Conference on Nutrition (ICN1), resulting in the demand for a National Plan for Nutrition	Use of UNICEF Conceptual Framework for Nutrition becomes common
1992	UNICEF/USAID/GoM/MoH	Universal salt Iodization discussed for the first time in Malawi	UNICEF Children's Summit
1992/1993	FSNU/UNICEF	Urban Nutrition Survey	Influx of urban population and neglected urban malnutrition
1996	World Vision International	Malawi Micronutrient and Health Programme (ended in 2005)	
2000	MoH/FSNU—MEPD	Revised National Plan of Action in Nutrition (NPAN); vice president approves NPAN	ICN1 triggered, but the development partners kept pushing for the development of NPAN
2000	GoM/MEPD	FSNU dissolved; nutrition orphaned as a multisectoral issue	Functional review of MEPD showed not much value added from the national-level coordination; human resource challenges cited for the weak capacity of the FSNU; dissolution of FSNU resulted in the national-level coordination of nutrition coming to a halt
2001	GoM / MBS: First National Micronutrient Survey / MoH	Amendment on sugar fortification guidelines	
2003	Valid International	Ready-to-use therapeutic foods	
2004	Office of the President and the Cabinet (OPC)	OPC DNHA established (August)	
2004/2005		Food and Nutrition Security Policy recommends food and nutrition security council in OPC	
2005	DNHA /OPC	Introduction of biannual Child Health Days (Vitamin A supplementation was supplied on these days.)	
2006	GoM/DNHA/OPC	Malawi Growth and Development Strategy; Adoption of Essential Nutrition Action to promote women and children nutrition (GoM 2013)	Millennium Development Goals 2, 4, and 5 provided the entry point for this intervention strategy (see Appendix Table A.1)

Table 2.5 Continued

Date	Actors	Actions	Triggering events
2006	DNHA/OPC	Promotion of optimal feeding practices of children 6–24 months	Malawi Growth and Development Strategy and National Nutrition Policy and Strategic Plan (NNPSP) meant to be the flagship policy documents for nutrition in Malawi
2007	DNHA/OPC	National food security and nutrition policy and strategic plan was finalized (includes HIV/AIDS) but not launched until 2010.	The policy combined with the strategic plan; its theme was ensuring adequate nutrition for all Malawians by 2020. The NNPSP recognized and alluded to the shortfalls that Malawi faced in the absence of a nutrition-specific policy coupled with weak coordination of nutrition interventions in the country. National Nutrition Policy (NNP) 2016–2020 (GoM 2016)
2008	MoH	Second National Micronutrient Survey	
2008		Fortification Rapid Assessment Tool	
2008	National Statistical Office (NSO)	2,000 households interviewed for Malawi Demographic Health Survey (DHS)	
2009	NSO	Multiple Indicators Cluster Survey	Re-evaluation of the interventions
2010	Department for International Development (DFID) / Irish Aid / DNHA	Malawi signs up to Scaling Up Nutrition (SUN) movement	
2010	*Lancet* series on nutrition emphasizes hidden hunger challenges	Launch of National Nutrition Policy and Strategic Plan	"NNPSP 2007–2012 was launched belatedly in 2010." (GoM 2013); as recognized by NNP 2016–2020
2010	Irish Aid / USAID / UNICEF	Sugar fortification advocacy started again	
	Irish Aid / International Potato Center (CIP) / Centro Internacional de Agricultura Tropical (CIAT)	Irish Aid funds program to root out hunger in Malawi with nutritious orange-flesh sweet potato (OFSP)	2001 micronutrient survey results
	DNHA	Development of Nutrition Education and Communication Strategy	Minimum dietary diversity (MDD) interventions needed effective use of foods
2011	CIP / Department of Agricultural Research Services / Ministry of Agriculture and Food Security	OFSP implementation started in Mulanje	
2011	SUN Group	Malawi awarded Early Riser recognition	
2011	GoM/DNHA	Government began to develop a Nutrition Act	
2011	DNHA	Principal Secretaries Symposium for micronutrient fortification	

Table 2.5 Continued

Date	Actors	Actions	Triggering events
2011	DNHA	Technical fortification standards for maize, wheat, and oil	
2011	OPC/DNHA	National Fortification Alliance formed	Full-scale fortification of all processed foods begins, with DNHA's persistence
2011	Illovo Sugar Ltd.	Illovo and government agree on a tax rebate for fortificants	Continued dialogue with Illovo on sugar fortification
2012	DNHA	Ranked second on Hunger and Nutrition Commitment Index	
2012	DNHA/UNICEF	Official launch of sugar fortification	
2012		School Health and Nutrition Policy (incomplete)	
2012	UNICEF/DNHA	Micronutrient strategy being developed	
2013	DFID	London Nutrition and Growth Summit; strategy and commitment paper prepared for Malawi	Following G8 Summit
2013		Civil Society Organisation Nutrition Alliance established	Malawi signed the New Alliance for Food Security and Nutrition in 2013
2013	DNHA	National Nutrition Policy finalized; high recognition of the hidden hunger; MDD challenges	*Lancet* series; SUN; London Meeting—Obesity included as malnutrition problem; "Developed through participatory and consultative processes that were steered by the Nutrition Task Force (NTF) under the guidance of the Department of Nutrition, HIV, and AIDS (DNHA) Management Team" (GoM 2013); development of the first National Agriculture Policy (with food and nutrition security as one of the pillars)
2014	FAO/UNICEF/DNHA	ICN2	Malawi sends a delegation funded by the donors, FAO, and UNICEF
2015	NSO	DHS includes micronutrient indicators for 3,000 households	
2015	MBS	Fortification standards gazetted	
2015	DNHA	Revision of the 2007 nutrition policy	

Source: Compiled by authors from personal interviews and several policy documents.

Notes: GoM: Government of Malawi; MBS: Malawi Bureau of Standards; MoA: Ministry of Agriculture; MoH: Ministry of Health MoG: Ministry of Gender, Children, Disability and Social Welfare; UNICEF: The United Nations Children's Fund; FAO: Food and Agriculture Organization of the United Nations; FSNU: Food Security and Nutrition Unit; USAID: United States Agency for International Development; MEPD: Ministry of Economic Planning and Development NPAN: National Plan of Action in Nutrition; MBS: Malawi Bureau of Standards; OPC: Office of the President; DNHA: Department of Nutrition, HIV, and AIDS; HIV: Human Immunodeficiency Virus Infection; AIDS: Acquired Immune Deficiency Syndrome; DHS: Demographic Health Survey; DFID: Department for International Development; OFSP: Orange-Flesh Sweet Potato; NSO: National Statistical Office; DHS: Demographic Health Survey; SUN: Scaling Up Nutrition; NNPSP: National Nutrition Policy and Strategic Plan; NNP: National Nutrition Policy; CIAT: International Center for Tropical Agriculture; CIP: Central Potato Research Institute; MDD: Minimum Dietary Diversity; ICN: International Conference on Nutrition.

In Malawi, nutrition is perceived as a multisectoral policy challenge. As a result, a wide range of actors and players are involved in the nutrition policy process. The first group includes the nutrition department in line ministries with mandates for nutrition-related activities. The second group of actors includes development partners—in particular, donors that work on nutrition initiatives. The third group of players includes national and international NGOs and civil society organizations that operate under the SUN framework for coordinating funding and implementing interventions.

Among state actors, DNHA (now in the MoH) has led various policy development processes since its inception. Six key ministries have nutrition as their mandate: the Ministry of Health; Ministry of Agriculture, Irrigation, and Water Development; Ministry of Education; Ministry of Industry and Trade; Ministry of Gender, Children, Disability, and Social Welfare; and Ministry of Local Government and Rural Development. Collective action for all these ministries is initiated by the Parliamentary Committee on Nutrition, which provides oversight on issues related to nutrition in the parliament, including budget allocation to nutrition intervention programs. The National Nutrition Policy and Strategic Plan (NNPSP) 2007–2012, published in 2008, mobilized all participants of the nutrition policy system and is currently being reviewed. The NNPSP was the outcome of extensive multisectoral discussions and was a joint product of the development partners and the government of Malawi. It highlighted the country's nutrition challenges and soon became the instrument for policy discussions related to human capital investments required to implement the nutrition policy. Several other strategy papers and guidelines were also used to support implementation of the NNPSP. (The next section of this paper elaborates on NNPSP's role in micronutrient program interventions.) The momentum generated from the design, adoption, and implementation of the NNPSP resulted in greater recognition of Malawi by the SUN movement. With continued support of President Bingu wa Mutharika, the DNHA enjoyed a high level of influence in nutrition policy making and implementation. However, after President Joyce Banda took over (after the sudden death of President Bingu), there was a change in the political affiliations, which meant that senior officials who had a close connection with President Bingu were replaced with officials who President Banda saw more favorably. As a result, DNHA's leadership changed and had a lower level of political support than it had enjoyed during President Bingu's tenure.

Nutrition Is Moving Back to the Ministry of Health

As mentioned earlier, DNHA is currently under the MoH. Each of the six key ministries has a nutrition focal person, with the title of either deputy director or chief nutrition and HIV/AIDS officer. DNHA is responsible for the coordination of nutrition under the MoH as well as other sectors. At the district level, a District Nutrition Coordination Committee manages all district-level activities.

A key issue that emerged from various interviews involved the public-sector reforms, which moved the DNHA to MoH. Previously, for almost a decade, the DNHA had been under the OPC; with the move, however, there was a shift in the focus on nutrition. The move was proposed because the OPC was overwhelmed by the responsibilities of the departments it was overseeing, and there was a need to "give back the responsibilities of the sectoral activities to the respective ministries," as described during our interviews with top government officials. Thus, several departments that had been under OPC moved to line ministries.

Although OPC nutrition stakeholders had mixed feelings about the move, most of the people interviewed felt this move would have a negative impact on nutritional programming and policy making. Some interviewees expressed their apprehension, saying that the move was a step backward from the progress that had been made since 2004, particularly because of the crosscutting nature of nutrition. In particular, interviewees said that under the OPC, progress had been significant not only in terms of the focus on nutrition policies and programs but also for the Malawi nutrition community, which now has human resources in 17 major ministries. Several interviewees mentioned that the decrease in childhood stunting from 51 percent to 47 percent since 2006 was due to improved coordination of nutrition activities under the OPC. However, the same success cannot be said for micronutrient deficiencies, as iron and vitamin A deficiencies increased during these years. In addition, the period of analysis is too short to give credit to this ministry.

It was felt that the move back to the MoH would threaten the coordination, as DNHA would not be able to oversee other ministries. In addition, other ministries would not consider monitoring activities within DNHA's mandate, which would thus increase difficulties in holding other departments accountable. Another common comment was that the MoH applies a curative approach. When nutrition

moved to OPC, DNHA was able to focus on both the curative and the preventative aspects of nutrition. Hence, most interviewees were not positive about this move.

High-Level Political Will Drives Policy Change

Most interviewees felt that nutrition is successful when there is high political will and a presence of champions. In the case of Malawi, the nutrition agenda was strengthened when the president himself became a champion of nutrition. During President Bingu's tenure, significant progress was made. For example, he commissioned the draft of the 2007 nutrition policy and established DNHA. Several interviewees also mentioned that the leadership of Mary Shawa as principal secretary in OPC was an important factor that helped increase the political visibility of nutrition-related issues. Shawa ensured that nutrition was not only taken seriously and moved from the Department of Health to the Office of the President but also that it remained on the policy-making agenda throughout. She also held other stakeholders accountable through her leadership. Hence, political will and the presence of champions can have a transformative role on a nation's nutrition agenda.

Change in Political Leadership

Interviewees also alluded to the fact that the change in political leadership from Bingu to Banda and then to Peter Mutharika saw a decline in nutrition progress. As stated earlier, during Bingu's time, nutrition was a priority, and initiatives were implemented to increase the profile of nutrition and improve the nutritional status of Malawians. However, after President Banda came into power, progress stagnated. Although she never made any changes to the previous nutrition structures but was driving initiatives, such as Safe Motherhood. Hence, she was not a champion of nutrition as President Bingu had been. After her party lost the elections in 2014, President Banda was replaced by Peter Mutharika, after two years in power. Although this current ruling party has been in power for just over a year, it is making organizational changes that may have a significant impact on nutrition. In addition, Malawi's vice president's appointment to IFPRI's Compact 2025 has a strong potential to mitigate the reduced political support for nutrition.

Revision of the Nutrition Policy

The latest draft of the National Nutrition Policy and Strategic Plan 2016–2020 was recently released. The previous draft for 2013–2018 took much more time to release due to the aforementioned organizational changes. In that time, a consultant was hired to revise the policy. Despite various stakeholder consultations, the efforts did not result in any concrete plans for the launch of a revised policy. The revision of the policy continues to be driven by DNHA, based in MoH. Interviewees mentioned that although the policy was at the final draft stage, there was no clear indication of when it would be released for public comment. Interviewees mentioned that not much has changed in the revised policy since its finalization in 2013. However, as an exception, it should be mentioned that recently SUN was incorporated into the 2013 policy. Since 2013, the DNHA staff has regularly attended the global Nutrition for Growth meetings in London, which led to the preparation of a strategy paper. This meeting was organized by DFID as part of the United Kingdom's follow-up to the G8 commitment. In addition to the incorporation of SUN, the new policy also considers issues related to nutrition transition, such as obesity and noncommunicable diseases.

Keeping this background in mind, we take a step further in the next sections and explain how specific micronutrient policy and program interventions are influenced by the changing institutional structures, delving deeper into the nutrition policy process of Malawi.

Key Policy Documents

Appendix Table A.5 describes the key policy, strategy, and guideline documents related to food, agriculture, and nutrition policies and micronutrient interventions. The strategic roles of some of the major policies in micronutrient policy process are described below:

- The National Micronutrient Strategy (NMS) 2013–2018[3] was prepared to be in line with the National Nutrition Policy. It identifies the problems of micronutrient deficiency in the country.
- The Nutrition Education and Communication Strategy (NECS) 2011–2016[4] was published in 2010. This strategy document is critical for not only directly addressing nutrition education and communication issues but also helping to support investment in human capacity to address knowledge gaps.
- The 2001 and 2009 National Micronutrient Surveys are often quoted and discussed as the basis of micronutrient policy dialogues.
- The Infant and Young Child Feeding (IYCF) strategy[5] provides a basis for building on the micronutrient strategy described below (Malawi, Ministry of Health and Population 2003a).
- The Community Management of Acute Malnutrition (CMAM) guidelines[6] provide support for the development of specific micronutrient strategies in the NMS.
- The National Nutrition Policy (2016–2020) implements nutrition policies in Malawi. Although micronutrient challenges are identified and broad policy and strategy solutions are presented in detail, this document leaves the formulation of specific micronutrient strategies to the NMS (GoM 2016).
- The Food Fortification Logo Guidelines (FTLG)[7] guide food-processing companies on how to effectively use the fortification logo. They also encourage more companies to comply with fortification standards. The guidelines reduce the misuse of the monitoring system and improve fortification governance (WHO 2006).

Key Regulations

Appendix Box A.2 lists the key regulations related to micronutrients in Malawi. These regulations provide the basis for monitoring micronutrient content of fortified foods.

Current State of Micronutrient Interventions

The latest NMS (2013–2018) of the government of Malawi presents a strategy to address the current state of micronutrient policy and program interventions. This section summarizes the salient features of the strategy to set the stage for tracing the policy process for each key micronutrient discussed in the subsequent sections. The NMS recognizes the contribution of micronutrients to the health status of the Malawian population. It mentions a wide range of micronutrients essential to healthy living, including

[3] NMS is still a working document and is yet to be finalized and officially released. However, key interviewees expect no substantial changes to be made before its release to public.

[4] NECS can be accessed at http://www.dnha.gov.mw/documents/NEC_Strategy_2012.pdf.

[5] IYCF can be accessed at https://extranet.who.int/nutrition/gina/sites/default/files/MWI%202003%20Infant%20and%20Young%20Child%20Nutrition%20Policy%20and%20Guidelines.pdf.

[6] CMAM can be accessed at https://www.fhi360.org/resource/training-guide-community-based-management-acute-malnutrition-cmam-pdf-english.

[7] FTLG can be accessed at http://www.who.int/nutrition/publications/guide_food_fortification_micronutrients.pdf.

vitamin A, vitamin B complex, vitamin C, vitamin D, iron, iodine, zinc, calcium, selenium, and fluoride. It indicates that deficiencies in vitamin A, iron, iodine, selenium, and zinc are a major public health concern caused by dietary deficiencies and poor absorption due to parasites and diseases such as malaria and HIV/AIDS infection. It identifies children under 5, pregnant or lactating mothers, and HIV patients as the most vulnerable populations that need micronutrient interventions.

The NMS identifies several challenges that continue to thwart the achievement of micronutrient goals in Malawi. In the context of supplementation, low coverage of iron/folate and vitamin A supplementation programs among pregnant and postpartum women and adolescent girls remains a challenge. Micronutrient supplementation programs still depend largely on donor resources, and the funds allocated to coordinate supplementation programs at the local level are inadequate. Further, poor compliance of pregnant women in taking iron/folate supplements also reduces the efficacy of the supplementation intervention.

In Malawi, salt iodization depends on imported salt, and monitoring iodine content has been a major challenge. Fortification of processed foods only became mandatory in 2015 with the official gazette on fortification standards for sugar, wheat, oil, and maize flour. Maize meal, the main staple food in Malawi, is largely processed at the household or local level. As of now, large-scale fortification and distribution systems do not exist.

Biofortification is in its early stages in Malawi, with adoption and use rates of biofortified crops quite low. Dietary diversification has not been adequately promoted in nutrition extension programs due to low coverage of farm home assistants. As a result, there are knowledge gaps in food storage, preparation, and use. In addition, monitoring and supervisory systems are not fully equipped to generate information on the adoption of biofortified crops.

Despite these challenges, several enabling factors have helped Malawi continue its micronutrient interventions in line with global development goals. Until recently, nutrition enjoyed a high-level political commitment, with its coordination managed directly by the OPC. The development of policies and programs has been coordinated with stakeholders. However, this coordination has slowed recently and may affect future implementation of micronutrient interventions. A series of policy, strategy, and guideline documents prepared and adopted over the years have led to the development of a framework for micronutrient intervention strategies. In Malawi, micronutrient fortification standards have been established. At the national level, coordination platforms, such as the National Fortification Alliance, continues to function. With respect to biofortification, research has yielded varieties of sweet potatoes, beans, and maize that will help meet nutritional deficiencies in the long run. However, to realize this long-term impact, the role of institutions is essential. In addition, the recent NMS outlines several key interventions and approaches to address micronutrient deficiencies (see Table 2.3), including promotion of dietary diversification, biofortification, fortification of processed foods, and nutrient supplementation. In addition, other public health interventions, such as immunization, deworming, and malaria control, are also promoted. Table 2.6 summarizes institutional roles and responsibilities for micronutrient policies in Malawi.

Table 2.6 Institutional roles and responsibilities for micronutrient policies in Malawi

Institution	Mandate	Roles and responsibilities
Office of the President and the Cabinet (OPC)	OPC is responsible for providing advice and support to the president and the cabinet. OPC also provides oversight and leadership in the public service.	Until 2014, OPC was responsible for the development and coordination of the nutrition policies and programs through the Department of Nutrition, HIV, and AIDS (DNHA).
Ministry of Health (MoH)	DNHA was established in August 2004 with the mandate to provide policy direction, guidance, oversight, coordination, monitoring, and evaluation and to facilitate the creation of implementation structures and capacity building on issues of nutrition, HIV, and AIDS in Malawi (MoH 2011).	• DNHA is currently with MOH. • Provides preventative and curative health services. • Advises on health and nutrition policy. • Maintains responsibility for the logistics related to essential drugs and regulation of drugs, including micronutrient supplements for iron and vitamin A. • Monitors fortified foods by testing at the border, district, and national levels. • Enforces food fortification regulations.
Local governments, departments of public health		• Organize national health days in collaboration with the MoH. • Enforce food fortification regulations in townships.
Ministry of Gender, Children, Disability, and Social Welfare	The ministry is mandated to promote gender equality and protect the welfare of Malawian women, men, girls, and boys to become self-reliant and active participants and beneficiaries of the national development agenda.	• Provides social protection and primary health care. • Is responsible for women's nutritional status and adolescent girls' nutrition.
Department of Nutrition, HIV, and AIDS		• Promotes food and nutrition policies and programs. • Coordinates, monitors, and evaluates implementation of food and nutrition policies. • Reports to the minister of health. • Registers community nutrition groups.
Central Health Information Services		• Tests food and drugs for compliance with national standards. • Monitors the fortification standards of mandated foods. • Developed the database for the National Fortification Alliance for monitoring micronutrient policies.
Malawi Bureau of Standards (MBS)	The MBS is a statutory organization established by an act of Parliament, Chapter 51:02, in 1972. Its mandate is to promote standardization of commodities and of their manufacture, production, processing, or treatment; and further to provide for matters incidental to, or connected with, standardization.	• Formulates national standards and testing procedures. • Sets standards and enforcement mechanisms for fortified and other foods.
Ministry of Agriculture, Irrigation, and Water Development – Food and Nutrition Sections		• Focal point for nutrition • Planning crop diversification • Promoting diversified diet through farm home assistants • Nutrition messages through agricultural extension

Table 2.6 Continued

Institution	Mandate	Roles and responsibilities
Department of Agricultural Research Services (DARS)	DARS is mandated to conduct research on all crops and livestock production.	• Development of biofortified crops • Testing and release of new seed varieties • Seed certification • Department under Ministry of Agriculture and Food Security
Ministry of Industry and Trade		• Collaborates with MoH on monitoring the imports of fortified food, particularly Iodized salt. • Monitors the compliance of food processors for meeting standards.
Lilongwe University of Agriculture and Natural Resources		• Conducts research on micronutrient deficiencies and surveys on micronutrient consumption. • Trains nutritionists for the country. • Provides expert opinions on issues related to micronutrient deficiencies, assessment methods, and the interpretation of results.

Source; Compiled by authors.

Notes: OPC: Office of the President and the Cabinet; HIV: Human Immunodeficiency Virus Infection; AIDS: Acquired Immune Deficiency Syndrome; DNHA: Department of Nutrition, HIV, and AIDS; MoH: Ministry of Health; MBS: Malawi Bureau of Standards; DARS: Department of Agricultural Research Services

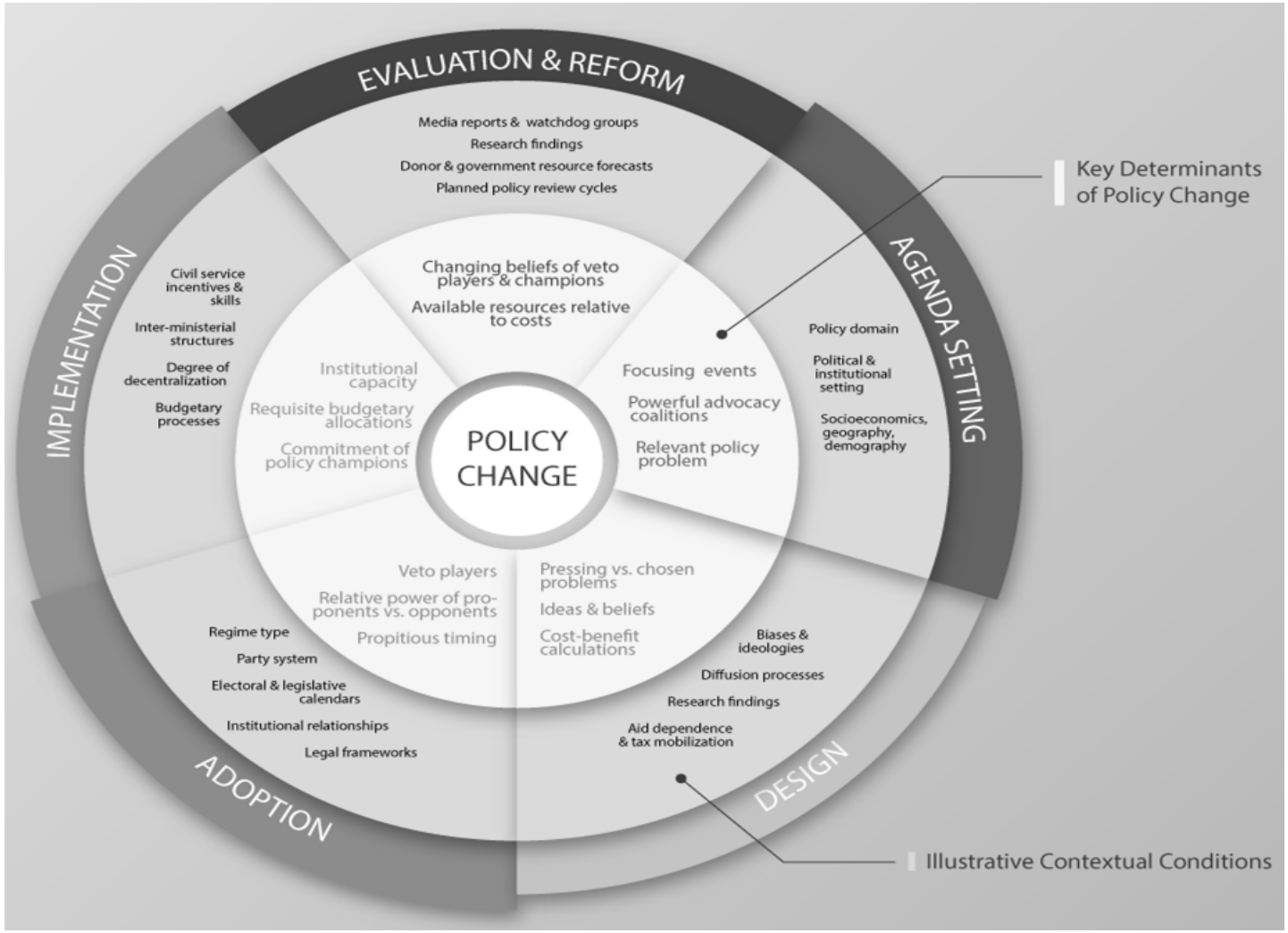
3. METHODS

This section describes the case study method and shows how the kaleidoscope model (KM) of policy process was applied to study micronutrient policy changes in Malawi. Understanding the policy process has been of interest to researchers from various perspectives. In the developed world, policy process theories focus on actors and players who initiate a policy issue and the ways in which they make it a policy debate for adoption and implementation (Sabatier and Weible 2014). Although the application of theories on the policy process in developing countries is limited, there is a growing need to understand how policies are made under various contexts and time frames. Political economists have approached the challenge from the perspective of how policy makers balance sound economic policy making with political realities (Meier 1991). Economic researchers have attempted to understand the role of political institutions in shaping sectorial policies (Bates and Block 2010). The recent food crisis of 2007–2008, and the reactionary responses of developing countries highlighted the need to understand their policy processes in order to avert another global food crisis (Pinstrup-Andersen, 2014). Based on the theories and applied research on policy processes, Resnick et al. (2015) developed a model that can help identify and test key hypotheses about the determinants of policy changes. Figure 3.1 presents the stages (outer circle), contextual conditions (middle circle), and key determinants (inner circle) of policy changes. Collectively, elements of these circles provide a set of 16 hypotheses that could be applied to a policy process in order to gain better understanding of the policy system actors, their interactions, and the outcomes.

The Kaleidoscope Model

This case study uses the analytical framework developed by Resnick et al. (2015), called the kaleidoscope model. This framework allows analysis of the drivers of policy change at various stages of the policy process. Figure 3.1 presents a diagrammatic representation of this model for food security.

Figure 3.1 The kaleidoscope model of food security policy change



Source: Resnick et al. (2015).

Data

Table 3.1 presents a set of hypotheses on key factors affecting policy change at various stages of the policy process. To test these hypotheses in the context of the micronutrient policy process in Malawi, we conducted semistructured interviews with key stakeholders.

Table 3.1 Kaleidoscope model hypotheses: Key variables affecting policy change

Policy stages
Kaleidoscope hypotheses
1. Agenda setting
1.1. Powerful advocates
1.2. Focusing event
1.3. Recognized, relevant problem
2. Design
2.1. Pressing versus chosen problem
2.2. Ideas and beliefs
2.3. Cost-benefit calculations
2.4. International design spillovers
3. Adoption
3.1. Propitious timing
3.2. Veto players
3.3. Relative power: proponents versus opponents
4. Implementation
4.1. Institutional capacity
4.2. Requisite budgetary allocations
4.3. Commitment of policy champion
5. Evaluation, Reform
5.1. Changing conditions
5.2. Changing information or beliefs
5.3. Resources available relative to cost

Source: Resnick et al. (2015)

We initially identified some of the key players in the nutrition policy process in Malawi and contacted them to arrange meetings. These key players were able to refer the research team to other important stakeholders. The team arranged meetings with a wide range of stakeholders in government, development partners and donors, academic institutions, and civil society to understand the history of nutrition policy in Malawi. The team members also hosted two workshops during this period—the National Agriculture Policy Consultation Workshop and a training session on policy communication. Several participants shared information at these workshops, and contact details were obtained for follow-up.

We began interviews with a set of key informants who play a major role in nutrition policy making and programing in Malawi. Through them we identified a second round of key informants. To collect the data used in this study, three rounds of interviews were conducted with different informants between April and September 2015.

In addition to the interview notes, published sources and gray literature on nutrition policy issues in Malawi were gathered for triangulation of information, further consultation, and filling gaps in the analysis. Information on the status of micronutrient deficiencies was collected from National Nutrition Survey.

The interview guide used for the selected key informants is similar to that used in the Zambia case study (see Appendix Box B.1). The first round of key stakeholders interviewed were selected from the stakeholder map presented earlier. The map of the nutrition policy system was further developed to identify actors and players and their role in the nutrition policy process. The interviews consisted of two broad sets of information gathering—first, regarding their role in the nutrition policy scenario in Malawi,

and second, regarding their interest and contribution to micronutrient policy challenges in Malawi. Appendix Table B.1. lists the 35 individuals interviewed for this case study.

The process of investigation in the Malawi case study took several rounds of visits to individuals and institutions. This process began with the identification of a set of individuals who were available to provide information about the policy processes for food and nutrition policies in Malawi. To avoid bias in data collection, institutions that ranged from government departments and donors to academic research institutions were included. As expected, individuals in these institutions were asked to describe the events of the policy process over the years from their perspectives and involvement. Although there were differences in their narration of events, most interviewees converged on broad issues and conclusions. Interviewing a wide range of individuals helped us to cross-check facts and bring together the policy events and influences in a systematic manner. It should be noted that high turnover of changing roles and movement of staff in government departments reduced the information that could be obtained through these interviews. However, individuals interviewed were able to guide us to others who were more informed. Thus, the cascading approach to information collection was used to verify the facts and get detailed information through further follow-up. The next section describes the tools used to test the kaleidoscope model in the context of Malawi's micronutrient policies.

Tools for Testing the Kaleidoscope Model

To ensure comparison with other case studies (such as in Zambia and Ghana), this case study used three sets of analytical tools:

- • Policy chronology
- • Stakeholder mapping
  - Stakeholder inventory
  - Policy system schematic
  - Circle of influence
- • Hypothesis testing template

Policy chronology involves the development of a timeline of policies related to thematic issues. This timeline helps us to study the sequencing of policy decisions and allows us to relate such decisions to other political, economic, and historical events. It shows why and when certain policies get triggered and helps to determine any patterns in policy issues that emerge in the policy system. The events identified in the chronology also help guide the interview process by enabling interviewees to relate their roles in the process and how they may have contributed to the development of a policy (or lack thereof).

Stakeholder mapping is a practical tool used to identify various actors, players, and organizations in the policy process. It shows not only how they are connected but also the strength of their influence in the policy system. By identifying their roles and their contributions at various stages of policy making, stakeholder mapping helps establish possible linkages and interactions among them. As with policy chronology, stakeholder mapping can help in studying the hypothesized relationship among various policy players. (A broad stakeholder map for the nutrition policy process was presented in Figure 2.1.) The next section provides specific stakeholder maps for the individual micronutrient policies studied.

In this paper, we test the hypothesis postulated through the kaleidoscope model. To prepare a summary of the evidence generated through interviews with a wide range of key improvements, we developed a table containing all hypotheses for a policy theme (vitamin A, for example). Tables in section 4 shows + and –signs to indicate the variable's positive or negative impact or influence on the policy outcome. Where there is no evidence of such impact, the cell is left blank. The hypothesis table helps further develop concrete conclusions after consulting selected interviewees on the influence of various factors affecting the policy process.

Validation of Hypothesis

To validate the responses received during the interviews with key informants, we used published reports and journal articles to verify facts on events and policy chronology for each micronutrient studied. We provide detailed hypothesis testing summaries (Appendix Tables C.1, C.2, and C.3) for each micronutrient to verify the extent to which they support the hypothesis. For each micronutrient policy, we first specify the main actors and policy actions from 1990 to 2015. Then, using the kaleidoscope model, we present evidence on different steps and their corresponding components. Hence, the table provides detailed information on agenda setting, design, implementation, and evaluation and reform for iodine, vitamin A, and iron. These tables help shed light on the major gaps or impediments involved in the micronutrient policy process.

4. DRIVERS OF POLICY CHANGE: A FORMAL TEST OF THE KALEIDOSCOPE HYPOTHESES

Iodine

Iodine deficiency disorders (IDDs) have been recognized in Malawi since the 1980s. A localized survey in Ntcheu district, in southern Malawi, reported that goiter frequency occurred in 59 percent of the total surveyed households (Bleichrodt et al. 1996; Thilly et al. 1993). Even though, the incidence of iodine deficiency has reduced since then, IDD continues to be a public health concern due to poor implementation and infrastructure for monitoring iodine content in imported salt. In 2006, Kenneth Maleta (2006) summarized the problem: "In Malawi, only 47.1 per cent of the households are estimated to have salt with at least 15 ppm [parts per million; the international standard for iodized salt at the household level]. Consistent with the harmonization regulations for iodized salt in southern Africa, the target at the household is for 100 percent of households to be using salt that contains at least 25 ppm iodine (ICCIDD 1991); yet, only 36.7 percent of the households in the 2001 national survey met this target." However, the 2010 Malawi Demographic and Health Survey (NSO and ICF Macro 2011) reported that 62 percent of households were consuming adequately iodized salt, defined as Iodine concentration greater than 15 mg per kg. What policy challenges continue to confront policy makers in reducing IDDs in Malawi? How are those challenges handled by the policy process? Can the kaleidoscope model help policy makers understand the drivers of policy change? We explore the answers to these questions below.

Policy Chronology

IDDs in the form of goiter were identified by ad hoc nutrition surveys conducted in 1968–1970 in selected regions of Malawi. However, it was not until the early 1990s that IDDs were brought to policy discussions, mainly driven by international and external events. The World Summit for Children and the International Conference on Children in the early 1990s were responsible for making the elimination of IDD a strategic goal. This triggering event, conducted by development partners in Malawi such as UNICEF and the US Agency for International Development (USAID), became part of the policy discussion in the country.

The Malawi Standard (MS-188), published in 1988 by the Malawi Bureau of Standards (MBS), indicated the availability of six technical and commercial types of salt. However, there was no indication of specific iodine content required for sale (MBS 2014). About 90 percent of the salt supply in Malawi is imported (MNS 2013). In the second edition of the standards, published in 1999, the iodine fortification requirement was specified at 80–100 ppm during importation and 50 ppm for retail marketing. The Billon Salt Bill on salt fortification came into existence after the Malawi Parliament passed the Salt Iodization Bill in 1995. However, the Iodization of Salt Act was not released until 1998 and did not appear in the gazette until 1999.

As shown in Table 4.1, in the late 19802, salt standards were set as a food commodity, though no standards were specified for its fortification with iodine. Salt iodization evolved from specification of standards to a gazette act over a period of eight years. The specification of salt standards for iodization in the 1990s was driven by three major events that called for the elimination of IDDs in developing countries. In Malawi, international goals were translated into a National Plan of Action for Nutrition throughout the 1990s. However, in terms of action, UNICEF and MoH used international guidelines for salt iodization as an opportunity to work with the Ministry of Trade and Industry and MBS as part of its effort to develop salt standards. The Iodization of Salt Bill was passed in 1995. However, it took another three years before the act was released and another year before the act was made a gazette. Finally, by 1999, salt iodization became law, and monitoring began at the country's borders. The salt importers and the companies that export salt to Malawi were notified about the law.

Table 4.1 Evolving salt iodization mandate in Malawi

Key years	1988	1999	2014/2015
Statutory instruments	First edition of salt specification, seemingly based on legislation passed on salt standards in 1985 (Maleta 2006)	Salt Iodization Bill passed in 1995; act released in 1998 and gazetted in 1999 (third edition of salt specification appeared in 2008)	Revision of standards discussed to meet East Central and Southern Africa (ECSA) health guidelines; serious consideration in Malawi
Requirement	None mentioned	Salt iodization becomes mandatory; standard specified	Standards may be revised but are still mandatory
Point of inspection	Not inspected	Salt inspected at port of entry and at the retail market	Continue the inspection at ports of entry, retail stores, and household (survey) levels
Fortification level (ppm potassium iodate)	Not specified	Household: 15–30 ppm Port: 35–80 ppm Retail market: 30–60 ppm	ECSA guidelines Level of addition: 45 ppm Factory: 33–56 ppm Retail: 30–56 ppm Market: 43 ppm
Enforcement agency	MoH	• MoH / Central Health Information Services Unit (CHISU) • MoIT • DNHA • MBS • NFA	• MoH/CHISU • MoT • DNHA • MBS • NFA: quarterly monitoring of salt at district level and post entry NFA in 2015
Enforcement level and challenges	Not enforced	Moderate enforcement; CHISU presents results to Micronutrient Taskforce during its meetings	Moderate; equipment and resources not adequate; NFA reviews the results from monitoring Iodization of salt

Source: Authors' interviews and published documents.

Notes: ECSA: East Central and Southern Africa; MoH: Ministry of Health; CHISU: Central Health Information Services Unit; MoIT: Ministry of Industry and Trade; DNHA: Department of Nutrition, HIV, and AIDS; MBS: Malawi Bureau of Standards; NFA: National Fortification Alliance; MoT: Ministry of Trade

Following the international goals to eliminate IDD, development partners—in particular, UNICEF and USAID—supported Malawi's discussions on salt fortification. Salt was chosen as the medium for iodine, mainly because it is easy to implement as importing companies could simply be notified and held accountable. Furthermore, by the time a global goal had been set, it was already clear that salt was the easiest vehicle for iodine fortification (ICCIDD 1991). The Hidden Hunger meeting, held in Montreal in 1991, had helped to assemble international evidence and experiences on salt iodization. Thus, there was not much of a debate on the choice of salt as the medium for iodine fortification. Indeed, salt was already reaching remote areas though normal market channels, and all Malawian households were using salt as part of their food preparation. An additional factor for the choice of salt is that the cost of fortification did not increase its price. This result on the cost effectiveness of iodized salt was also demonstrated by the experience of other countries (WHO 2004). In the mid-1990s, UNICEF and USAID helped provide salt testing kits for monitoring iodized salt. However, the penalties for violation of salt iodization were not effective until salt standards were gazetted in 1999. It is important to note that unless standards are gazetted, violators cannot be held accountable by a court of law, as mentioned in our interviews. Thus, salt monitoring was legally effective only after 1999, when it began at the ports of entry, retail, and household levels.

Its continued efforts at monitoring salt iodization over the past 15 years has led Malawi to make considerable progress in reducing IDDs. As mentioned earlier, about 36.7 percent of households in the 2001 national survey met the target of consuming iodized salt with a concentration of more than 15 mg per kg. In 2010, the Malawi Demographic Health Survey reported that 62 percent of households were consuming adequately iodized salt; however, the recent National Micronutrient Survey results indicate

that 29 percent of school-aged children and 26 percent of nonpregnant women of reproductive age still suffer from IDDs (NMS 2013). The NMS (2013) also identifies inadequate infrastructure and funding, as well as porous borders, as major challenges in monitoring salt for iodine content and achieving full coverage of salt iodization in Malawi. Table 4.2 gives the policy chronology for iodine in Malawi.

Table 4.2 Iodine policy chronology in Malawi

Date	External and internal events, influence, and triggers	Domestic context and policy events
1939/1940	First longitudinal food and nutrition study	Awareness of nutrition as a problem; symptoms of nutritional disorders identified but not of any specific micronutrients
1968–1970	Ad hoc nutrition surveys in Chiradzulu, Lower Shire, and Nkhotakota	High prevalence of malnutrition (Burgers and Wheeler 1970)
1986	First Nutrition Symposium of Principal Secretaries organized by Center for Social Research and government of Malawi, supported by UNICEF	Recognition of nutrition as a multisectoral challenge; establishment of Food Security and Nutrition Unit in Ministry of Economic Planning and Development
1988		First edition of salt specifications in the Malawi Bureau of Standards
1989	A 1989 survey in 10 districts reported a total goiter rate of 12.7 percent, with widely scattered severely endemic areas (Malawi, Ministry of Health and Population 1998, as quoted in Maleta [2006]).	A 1989 review of iodine supplementation surveys showed that 56 percent of the 177,137 women and children examined in some districts in Malawi from 1983 to 1989 had goiter (Malawi, Ministry of Health and Population 1998, as quoted in Maleta [2006]).
1992	Malawi participates in first International Conference on Nutrition (ICN1)	Assigned responsibility for the development of National Plan of Action for Nutrition; elevation of IDD recognized as part of the plan
Circa 1996	Micronutrient deficiencies become regular part of discussions between donors and MoH	First Micronutrient Committee formed
1990–1995	USAID/UNICEF work with MoH to develop salt iodization bill	Salt Iodization Bill passed in 1995 in Parliament and act released in 1998
1999	MBS specifies the salt iodization standards	Specified in Chapter 52:02; gazetted February 15, 1999
2001	Serious drought in Malawi; Save the Children conducts localized nutrition surveys, which show high levels of micronutrient malnutrition	On a visit to Swaziland, President Bakili Muluzi announces food crisis; first National Micronutrient Survey conducted and results published, showing high levels of IDD
2003	Regional consultation on fortification	
2004	Office of the President and the Cabinet (OPC)	August: OPC DNHA established
2004/2005	Food and Nutrition Security Policy	Recommends food and nutrition security council in OPC
2005	DNHA/UNICEF/MoH	Introduction of Child Health Days
2005	DNHA/OPC	Introduction of biannual Child Health Days (Vitamin A supplementation was supplied on these days.)
2006	GoM/DNHA/OPC	Malawi Growth and Development Strategy
2006	DNHA/OPC	Promotion of optimal feeding practices of children 6–24 months
2007	DNHA/OPC	National food security and nutrition policy and strategic plan finalized (includes HIV/AIDS)
2008	NSO/MoH	Second National Micronutrient Survey

Table 4.2 Continued

Date	External and internal events, influence, and triggers	Domestic context and policy events
2008		Fortification Rapid Assessment Tool
2008	NSO/USAID	2,000 households interviewed for Demographic Health Survey
2009	NSO	Multiple Indicators Cluster Survey
2010	Donors initiate SUN	Malawi signs up to SUN
2010	*Lancet* series emphasizes "hidden hunger"	Launch of National Nutrition Policy and Strategic Plan (NNPSP)
2013	June: London meeting on Global Nutrition for Growth; NNPSP expired	National Nutrition Policy 2013–2018 drafted
2016	Draft National Micronutrient Strategy 2016–2020	

Source: Authors' compilation.

Notes: UNICEF: ICN: MoH: USAID: United States Agency for International Development; UNICEF: The United Nations Children's Fund; IDD: Iodine Deficiency Disorder; OPC: Office of the President and the Cabinet; DNHA: Department of Nutrition, HIV, and AIDS; GoM: Government of Malawi; NSO: National Statistical Office; HIV: Human Immunodeficiency Virus Infection; AIDS: Acquired Immune Deficiency Syndrome; SUN: Scaling Up Nutrition; NNPSP: National Nutrition Policy and Strategic Plan

Stakeholder Mapping for Iodization Policy in Malawi

The following key set of actors provided the policy and pragmatic support for salt iodization. As part of its mandate, MoH has also played a leading role in keeping salt iodization part of the micronutrient strategy over the years.

Among the government entities, DNHA—both under OPC and now under MOH—continues to play a critical role in the debates and discussion on micronutrient policies, including IDDs. The MBS, Ministry of Industry and Trade, and the Central Health Information Services Unit (CHISU) of MoH play important roles in implementation from the government's perspective.

In Malawi, the implementation of salt iodization rests solely with the private sector. Salt is imported from Botswana, Tanzania, and Mozambique. Importers and exporters of salt to Malawi have been informed to ensure that they iodize salt. At the local implementation level, port health officers (PHOs) and food hygiene officers (FHOs) play a major role in monitoring iodine levels at the port of entry and at retail markets in the districts. Because most salt is imported, major responsibility for maintaining salt standards falls on the PHOs at the borders. These officers use salt iodization monitoring equipment, provided by UNICEF, to conduct semiquantitative tests that enable them to determine the levels of iodine in salt. The PHOs check every consignment that enters the country.

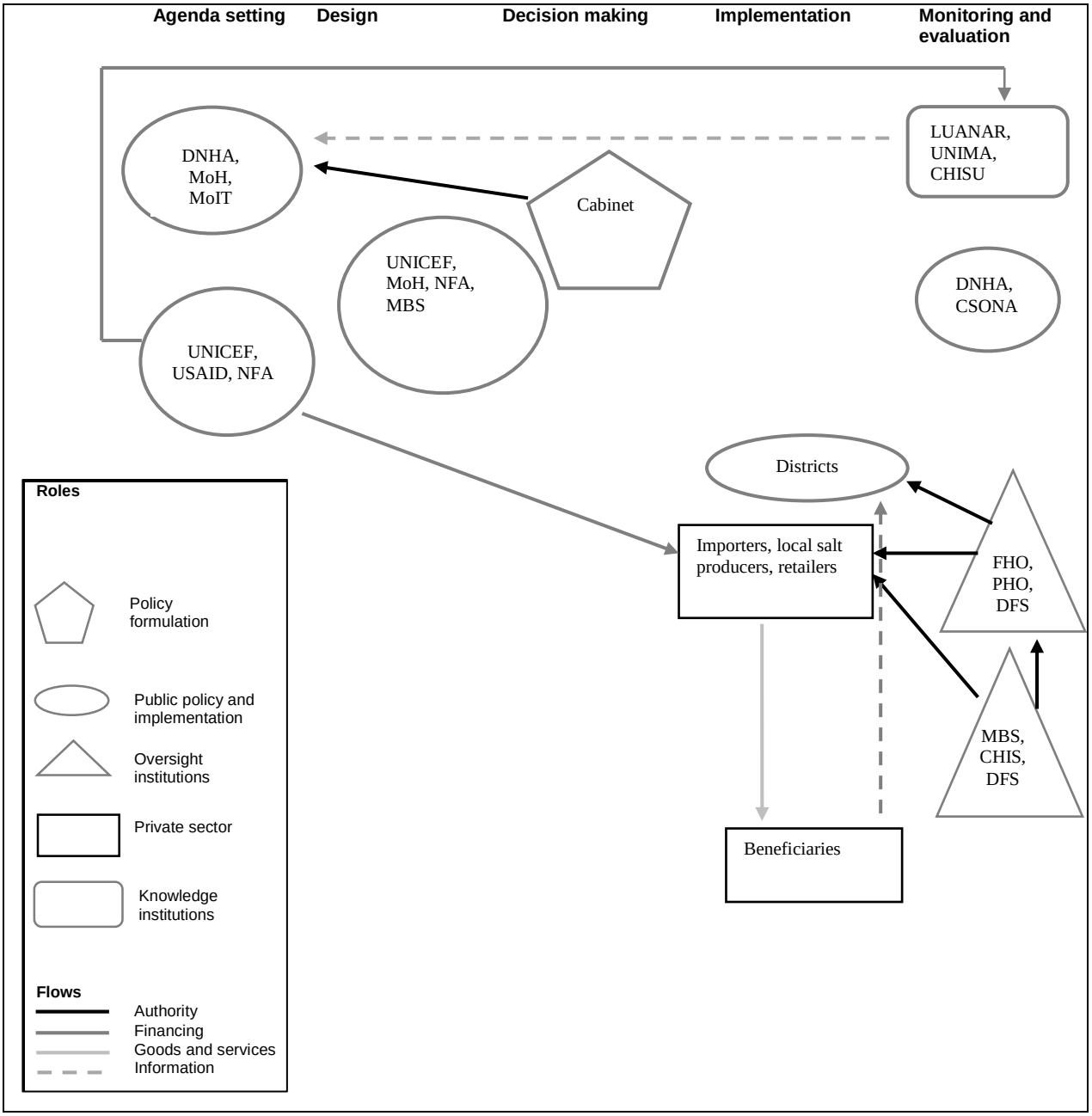
At the district level, FHOs monitor salt through on-the-spot checks. In an effort to monitor their work, both PHOs and FHOs are required to provide samples to CHISU on a quarterly basis. The Ministry of Education also plays an important role in monitoring salt iodization, with schoolchildren encouraged to bring salt samples to school. FHOs then test these samples.

Development partners—in particular, UNICEF and USAID—have supported salt iodization in Malawi. These partners, in partnership with MoH, have been instrumental in translating global IDD goals into a national intervention program. Over the years, they have provided support for advocacy, education and training, equipment and chemicals for fortification, and policy dialogue and debate. Donors have also been supportive of the National Micronutrient Surveys, which have helped track the progress made in the fight against IDDs.

Over the years, the research groups at Chancellor College and Bunda College of Agriculture (now Lilongwe University of Agriculture and Natural Resources, or LUANAR) have provided research support to help track the prevalence of IDDs. In recent years, they have increasingly participated in the formulation of food safety standards.

Researchers from LUANAR, the University of Malawi, and external institutions also play a critical role in generating information about the consumption of iodized salt. The medical research community has been active in generating micronutrient-related information from field studies (Maleta 2006). Global research teams have conducted localized field research that has been useful in highlighting problems at the early stages of IDD policy development (Thilly et al. 1993). Figure 4.1 maps the interactions of these stakeholder groups.

Figure 4.1 Institutional mapping of Malawi's iodine policy process



Source: Authors' field interviews.

Notes: DNHA: Department of Nutrition, HIV, and AIDS; MoH: Ministry of Health; MoIT: Ministry of Industry and Trade; UNICEF: The United Nations Children's Fund; NFA: National Fortification Alliance; MBS: Malawi Bureau of Standards; USAID: United States Agency for International Development; CSONA: Civil Society Organisation Nutrition Alliance; FHO: Food Hygiene Officer; PHO: Port Health Officer; CHISU: Central Health Information Services Unit.

Table 4.3 summarizes the roles and influence of various stakeholder groups in the development and implementation of IDD interventions. There is no opposition to the policy of iodization of salt in the country. While some merchants are neutral about salt iodization, most government departments and donors support it.

Table 4.3 Iodine policy stakeholder inventory in Malawi

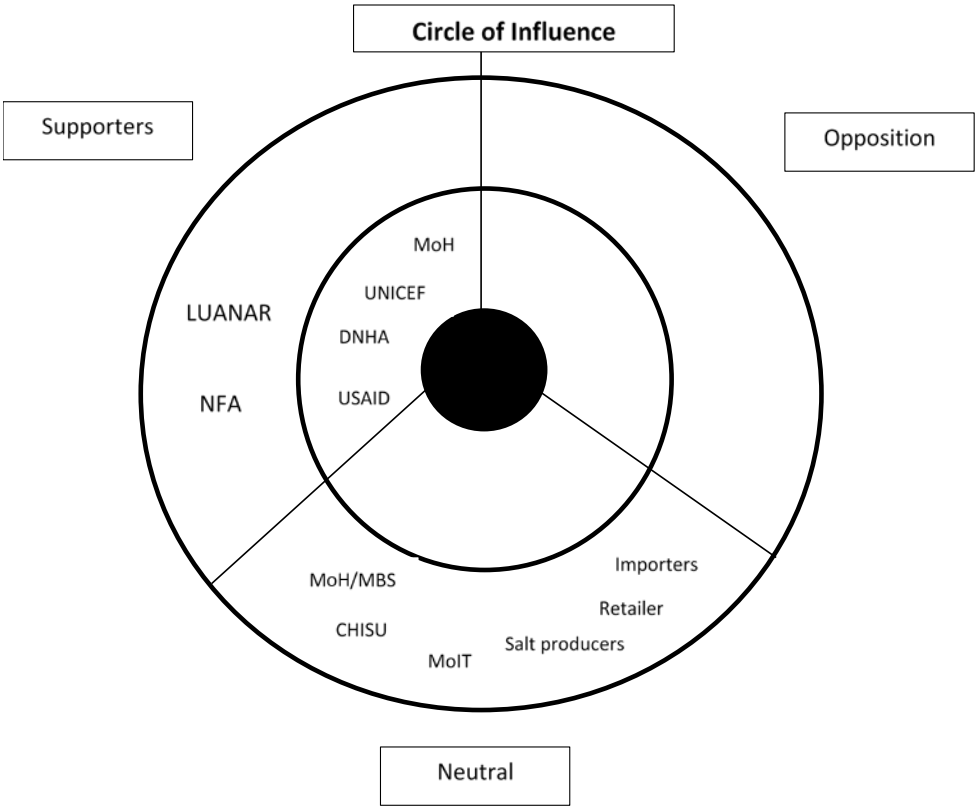
Institution	Category	Role	Resources	Influence	Policy stance
MoH	Government	• Issue regulations • Enforcement • Education	• Limited	• Large	Advocate
DNHA	Government	• Identify key issues and policy options • Monitor implementation • Advise MoH and GoM	• Limited	• Large	Champion
NFA	Government	• Identify fortification opportunities	• Mostly donor supplied	• Large	Champion
MBS	Government	• Set standards and testing protocols	• Limited	• Large	Neutral
Ministry of Industry and Trade (MoIT)	Government	• Customs officers collect samples of imported salt	• Limited	• Modest	Advocate
MoH/CHISU	Government	• Tests samples	• Limited	• Limited	Neutral
Importers	Private sector	• Imports	• Limited	• Limited	Neutral
Local salt producers	Private sector	• Fortify salt	• Small	• Limited	Neutral
Foreign salt producers	Private sector	• Fortify salt	• Large	• Large	Neutral
Retailers	Private sector	• Retail salt to consumers	• Small	• Limited	Neutral
UNICEF	Donors	• Funds studies • Funds testing • Funds education • Technical assistance	• Large	• Large	Champion
USAID	Donors	• Funds studies • Funds testing • Funds education • Technical assistance	• Large	• Large	Advocates
LUANAR (and other researchers)	Researchers	• Empirical research • Inform policy makers	• Limited	• Large	Advocates

Source: Authors' compilation.

Notes: MoH: Ministry of Health; DNHA: Department of Nutrition, HIV, and AIDS; NFA: National Fortification Alliance; MBS: Malawi Bureau of Standards; MoIT: Ministry of Industry and Trade; CHISU: Central Health Information Services Unit; UNICEF: The United Nations Children's Fund; USAID: United States Agency for International Development; LUANAR: Lilongwe University of Agriculture and Natural Resources; GoM: Government of Malawi.

Finally, Figure 4.2 presents the circle of influence for iodine fortification in Malawi. In the Malawi policy process for iodine, donors played a significant role in the beginning; this role was further taken up by the government. The National Fortification Alliance and other government departments continue to exert major influence on iodized salt distribution.

Figure 4.2 Iodine fortification circle of influence in Malawi



Source: Authors' field interviews.
Notes: MoH: Ministry of Health; UNICEF: The United Nations Children's Fund; DNHA: Department of Nutrition, HIV, and AIDS; USAID: United States Agency for International Development; LUANAR: Lilongwe University of Agriculture and Natural Resources; NFA: National Fortification Alliance; MoH: Ministry of Health; MBS: Malawi Bureau of Standards; CHISU: Central Health Information Services Unit; MoIT: Ministry of Industry and Trade.

Hypothesis Testing

Agenda Setting

In the mid-1980s, the regional UNICEF office in Malawi brought nutrition challenges into the policy arena, leading to a series of nutritional status maps. As a result, salt iodization as a micro nutrition strategy was seriously discussed in the early 1990s for the first time (Bleichrodt et al. 1996; Thilly et al. 1993). Two major events drove discussions on the minimum dietary diversity (MDD) and IDDs in Malawi. First, the World Summit for Children, organized in September 1990 by UNICEF, set the goal for the elimination of IDDs among children. The second event—the first International Conference on Nutrition (ICN1)—also reinforced this goal. During ICN1, the policy makers, as part of the declaration on nutrition, committed to developing and implementing national action plans.

In Malawi, the National Plan of Action for Nutrition was developed over six years and was published in 2000. In addition to international meetings and the momentum generated by them, the direct intervention of UNICEF and the World Health Organization (WHO) helped initiate dialogue about the MDD with ministries of health across all African countries. Malawi's approach of including IDDs on the policy and programmatic agenda was typical. Malawi's National Plan of Action for Nutrition was drafted after international conferences and as part of the efforts of the Inter-ministerial Food and Nutrition Committee, which included government, academia, UNICEF, NGOs, and the private sector. The Committee developed the Food Security and Nutrition Policy Statement in 1990 as an addendum to the

development policy. The goal of the policy statement was to improve the food security and nutritional status of all households in Malawi. This groundwork was responsible for the ready acceptance of the problems of MDD and for making IDDs a policy priority in the early 1990s.

IDD appears in the policy agenda in the Infant and Young Child Nutrition Policy and Guidelines (Malawi, Ministry of Health and Population 2003a). The guidelines acknowledge the significant reduction in IDDs over the years, from 56 percent to less than 5 percent (measured by the total goiter rate). They attribute the reduction levels to the iodization of salt. They also recognize the results of the 2001 National Micronutrient Survey, which showed that although 715 of Malawian households surveyed used iodized salt, only 36 percent of the salt used met the mandatory requirement (Malawi, Ministry of Health and Population 2003b). Again, the challenge of monitoring imported salt by the PHOs at ports of entry, the FHOs in the district and city assemblies, health surveillance assistants, and the MBS are key constraints to the use of iodized salt by households. Table 4.4 summarizes the findings from our hypothesis.

Table 4.4 Iodine policy hypothesis testing

Policy stages	**Policy actions: Iodine fortification of salt**		
Kaleidoscope hypotheses	**1988**	**1990–1999**	**2011–2015**
1. Agenda setting			
1.1. Powerful advocates		+++	+
1.2. Focusing event	+	+++	+
1.3. Recognized, relevant problem	+	++	
2. Design			
2.1. Pressing versus chosen problem			
2.2. Ideas and beliefs			
2.3. Cost-benefit calculations	+	++	+
2.4. International design spillovers	+	+	+
3. Adoption			
3.1. Propitious timing	+		
3.2. Veto players			
3.3. Relative power: proponents versus opponents		+	+
4. Implementation			
4.1. Institutional capacity	-		
4.2. Requisite budgetary allocations	-	++	-
4.3. Commitment of policy champion	+	++	
5. Evaluation, Reform			
5.1. Changing conditions	+	+	+
5.2. Changing information or beliefs	+	+	+
5.3. Resources available relative to cost		+	

Source: See Appendix Table C.1 for details.
Notes: + = significant positive impact of this variable on policy outcomes; - = significant negative impact of this variable on policy outcomes.

Design

In the *design* of the IDD intervention, the successful experience of the fortification of common salt with iodine in most of Africa south of the Sahara was influential for the design in Malawi. This design gained particular momentum after the 1991 Hidden Hunger conference in Montreal. Because most of Malawi's salt is imported, Malawian decision makers found it logistically convenient to use salt as a vehicle for IDD intervention. By the early 1990s, salt also proved to be the most technically feasible and cost effective approach to solving IDDs (WHO 2004; Horton et al. 2008; UNICEF 2010). The standards for fortification established by WHO and the International Council for Control of Iodine Deficiency Disorders (ICCIDD) were adopted directly as the standard for salt iodization in Malawi.

Adoption

The MBS established the first set of quality standards for table salt in 1988. However, no standards for iodine levels were specified. After the international momentum for salt iodization in the early 1990s, the *adoption* of the Universal Salt Iodization standards for Malawi became the obvious choice, particularly due to the support of UNICEF and WHO.

UNICEF and WHO helped MoH develop the Iodization of Salt Bill that was placed before Parliament in 1995. A year later, in 1999, the bill was gazetted. The adoption of salt iodization as a law was unopposed, particularly when its benefits were demonstrated. Adoption of the law was at a low cost to government and donors, which was another reason they fully supported it. Currently there is discussion in Malawi about the revision of standards to meet East Central and Southern African (ECSA) health guidelines.

Implementation

Monitoring the implementation of salt iodization protocols at various levels is recognized as the key to ensuring that the salt consumed in Malawi is fortified with iodine. Because all the salt consumed in Malawi is imported, the problem for implementing the Iodization of Salt Bill is the strict monitoring of salt imported into the country. In Malawi, private-sector traders and food importers import and distribute salt through regular marketing channels. However, the Malawian government is responsible for monitoring and enforcing the Bill. In implementing this role, the Malawian government depends on donor support to help with the development of infrastructure, salt testing equipment, training of staff at various levels, and conducting specific studies to monitor the consumption of iodized salt. Over the years, donors have been supportive in training the staff of the MoH, CHISU, custom officials, and field officials involved in salt testing at the district levels. However, interviews with MoH officials indicate that the monitoring of salt iodization is not systematic and that the supply of testing equipment, funds for traveling to retail stores, and regular reporting of monitoring results to headquarters all remain a challenge.

Evaluation and Reform

The National Micronutrient Surveys of 2001 and 2009 show considerable progress in the coverage of iodized salt consumption by Malawian households. Several studies have been conducted on the status of iodized salt consumption in the country; however, these have been localized. Kenji, Nyirenda, and Kabwe (2003) showed that 50 percent of Malawian salt samples studied had levels within the recommended range of 80–100 mg/kg. Salt obtained from supermarkets in Malawi registered the highest concentrations (mean of 101.6 mg/kg), while that sold in the open markets by vendors contained an average of 68.1 mg/kg, with the lowest level of 17.6 mg/kg obtained in salt supplied by small-scale salt producers. Currently, there is a discussion to reexamine the iodine fortification standards to be in line with ECSA standards. These discussions may trigger further reforms in iodine fortification in Malawi.

Based on the above discussion, Figure 4.2 presents the iodine fortification “circle of influence” in Malawi. Table 4.2 summarizes the results of the hypothesis testing of the kaleidoscope model. Based on the hypothesis testing summaries presented in Appendix Table F.1, three different time periods are used to describe the impact of the variables identified by the kaleidoscope model on policy actions and outcomes in the country. During the 1980s, the problems of IDDs were recognized, and the initial results of the study helped bring this concern to the policy agenda. However, it was only in the early 1990s, after the international meetings that set the global goals for the elimination of IDDs, did the national systems and donor community begin serious efforts to design and implement intervention programs. There is increasing concern of overiodization among the urban poor. In recent years, efforts to keep IDDs on the policy agenda focused on alignment with the ECSA standards, though there is continued pressure on maintaining the resources and infrastructure needed for effective monitoring of program interventions.

Vitamin A

Vitamin A deficiencies (VADs) are high on Malawi's nutrition policy agenda. The recent final draft of the National Nutrition Policy 2016–2020 (GoM 2016) highlights the importance of VAD as a major issue among children under 5 and women. This micronutrient deficiency is also facing implementation challenges in terms of both supplementation coverage and monitoring the vitamin A content of fortified foods. Although biofortification of maize has begun, it requires continuous policy and funding support to develop varieties and to scale up its adoption. This section looks at the policy processes related to vitamin A intervention policies and programs in Malawi.

By the 1970s, the existence of night blindness as a public health challenge was well known among clinical nutritionists in Malawi. The results of a 1974 survey also confirmed night blindness as a major issue in the country (Mtumuni 1974). A survey conducted by Tielsch et al. (1986) in the Lower Shire region showed high levels of cornea-related blindness; multiple causes were cited for this, including the deficiency of vitamin A in diets, general malnutrition, measles, and trachoma (Maleta 2006). The same survey also indicated that high levels of severe xerophthalmia (3.9 percent), night blindness (close to 20 percent), and corneal scars exceeded the WHO cutoff point by 10 times. All diseases indicated VAD. The national-level micronutrient surveys of 2001 and 2009 continued to show the challenge of VAD (see Appendix Table A.2). In 2001, based on a serum retinal level of 20 μg/dL (which is the WHO cutoff point for VAD), the first National Micronutrient Survey results showed that, in Malawi, 60 percent of preschool children, 38 percent of schoolchildren, 57 percent of women of childbearing age, and 38 percent of men were vitamin A deficient. Although the 2009 National Micronutrient Survey results showed considerable progress in reducing severe VAD, the prevalence of moderate VAD was still high (Appendix Table A.2).

Policy Chronology

Three major sets of interventions constitute vitamin A policy interventions in Malawi over the past 20 years. The first was the follow-up to the 1990 World Food Summit and the 1992 International Conference on Children; this follow-up resulted in quick mobilization of resources and organizational logistics to provide vitamin A supplements. By 1995, Malawi had begun the distribution of vitamin A capsules though district health facilities and village-level health volunteers (Berger et al. 1995). However, due to poor coverage and the need to address HIV/AIDS-related nutritional issues, additional interventions were sought, including fortification of processed foods. Sugar fortification success in other countries, particularly Guatemala, indicated that Malawi could effectively implement a sugar fortification program.

The MoH and UNICEF jointly began discussions on the fortification of sugar, as it was thought that using other processed foods may not reach Malawi's vulnerable population. More recently, efforts to undertake research on biofortified foods such as OFSP and orange maize have been promoted in Malawi, though this approach is still at an infant stage. In addition, efforts to include other commonly consumed processed foods, such as oil, wheat, and maize flour, in the fortification mandate have been successful. Table 4.5 gives the policy chronology of vitamin A in Malawi.

Table 4.5 Vitamin A policy chronology in Malawi

Date	External and internal events, influence, and triggers	Domestic context and policy events
1939/1940	First longitudinal food and nutrition study	Awareness of nutrition as a problem; symptoms of nutritional disorder identified but not of any specific micronutrients
1968º1970	Ad hoc nutrition surveys in Chiradzulu, Lower Shire, and Nkhotakota	High prevalence of malnutrition (Burgers and Wheeler 1970)
1983	Chikwawa study found a 3.9 percent prevalence of vitamin A–related xerophthalmia in children; suggested older children were more likely to have xerophthalmia (Tielsch et al. 1986)	Highlighted the need for intervention in policy circles. Was helpful in mobilizing MoH and Catholic Relief Services by UNICEF in 1986 to support a conference on nutrition for the PSs of various ministries

Table 4.5 Continued

Date	External and internal events, influence, and triggers	Domestic context and policy events
1986	First nutrition symposium of PSs organized by Center for Social Research and government of Malawi, supported by UNICEF	Recognition of nutrition as a multisectoral challenge (MoH 1986); establishment of Food Security and Nutrition Unit in Ministry of Economic Planning and Development
1990–1992	Malawi participates in World Summit for Children in 1990 and ICN1 in 1992.	Assigned responsibility for the development of National Plan of Action for Nutrition. Elevation of IDD was recognized as part of the plan; goals of eliminating MDD became part of MoH/donor discussion.
Circa 1996	Micronutrient deficiencies—in particular, vitamin A deficiency—become regular part of discussions between donors and MoH.	First Micronutrient Committee formed; MoH and UNICEF show early interest in sugar fortification.
1997/1998	Illovo buys Lonrho Sugar company.	Illovo begins operations.
2001	Serious drought in Malawi; Save the Children conducts localized nutrition surveys, which show high levels of vitamin A deficiency symptoms. This triggered local response to address the issues.	On a visit to Swaziland, President Bakili Muluzi announces food crisis; first National Micronutrient Survey conducted and results published; confirms high levels of VAD (Appendix Table A.2).
2002	MBS drafts sugar fortification standards for gazetting to make it a mandate.	Illovo, the only sugar company, was not consulted or informed on these standards.
2003	Regional consultation on fortification; in August, Illovo is notified by MoH, MBS, and Ministry of Industry and Trade that MBS has a sugar standard that is ready to be gazette.	Illovo expresses concerns, raises strong objections, and formally objects. The minister for agriculture, who was also the second vice president, supported the sugar industry and stopped the gazetting process.
2004	OPC/DNHA/UNICEF	August: OPC DNHA established; advocates for sugar fortification lobby harder. MoH allied with UNICEF. UNICEF representative appealed to President Bingu. UNICEF and MoH took a more conciliatory approach to discuss Illovo's concerns. DNHA and UNICEF agree to help Illovo become ready for sugar fortification. UNICEF commissioned studies on Illovo's concern.
2004/2005	Food and Nutrition Security Policy	Recommends a food and nutrition security council in OPC. Instead, President Bingu decides to place DNHA in OPC to play the coordination role of nutrition in Malawi.
2005	DNHA / UNICEF / USAID / WHO / other donors	Introduction of Child Health Days; biannual supplementation of vitamin A and iron.
2006	DNHA/OPC/UNICEF	DNHA calls stakeholder meeting to review competitiveness study results. Study recommends subsidizing equipment costs and early chemical costs; concludes that fortification will increase consumer price by 2 percent.
2006	GoM/DNHA/OPC	Malawi Growth and Development Strategy
2006	DNHA/OPC	Promotion of optimal feeding practices of children 6–24 months
2007	UNICEF/DNHA	Many meetings of the UNICEF-advocated Working Group. In December, stakeholder forum brings in vitamin A countries to discuss experience (Zambia, Nigeria, Guatemala). Chair (PS of DNHA) makes impassioned appeal to fortify all foods.
2007	DNHA/OPC	National food security and nutrition policy and strategic plan finalized (includes HIV/AIDS)
2008	MoH/NSO/DNHA	Second National Micronutrient Survey
2008		Fortification Rapid Assessment Tool
2008		2,000 households interviewed for Demographic Health Survey
2008	DNHA/MoH/Illovo/UNICEF	November: Study tour to Zambia and Guatemala

Table 4.5 Continued

Date	External and internal events, influence, and triggers	Domestic context and policy events
2009	NSO	Multiple Indicators Cluster Survey
2009/2010	Illovo/UNICEF/DNHA	Trial fortification undertaken for one year in various parts of the country. Conducted stability and sensorial tests. Tests suggested hardly any problem and allayed fears about fortification.
2010	Donors initiate SUN	Malawi signs up to SUN.
2010		Launch of National Nutrition Policy and Strategic Plan (NNPSP)
Circa 2011	Illovo/DNHA/UNICEF	Memorandum of Understanding signed between Illovo and DNHA. Stipulates responsibilities of government/UNICEF to provide equipment, three years of fortificants. Illovo to fortify according to stipulated standards. Donor provides only two years of free fortificants.
2012/2013	Illovo/UNICEF	Voluntary fortification begins
2013	NNPSP expired	National Nutrition Policy (2013–2018) drafted
2015	Draft national micronutrient strategy (2013–2018)	MoH recognizes the need for improving the monitoring systems and keeping a close check on the fortification of processed foods. National Fortification Alliance meetings help in this process by bringing together the donors, private sector, and government. Fortification standards become mandatory for wheat and maize flour, cooking oil, and sugar through gazetting in May.

Source: Authors' compilation.

Notes: MoH: Ministry of Health; ICN: International Conference on Nutrition; MDD: Minimum Dietary Diversity; UNICEF: The United Nations Children's Fund; VAD: Vitamin A Deficiency; MBS: Malawi Bureau of Standards; OPC: Office of the President and the Cabinet; DNHA: Department of Nutrition, HIV, and AIDS ; WHO: World Health Organization; GoM: Government of Malawi; PS: Principal Secretary; NSO: National Statistical Office; HIV: Human Immunodeficiency Virus Infection; AIDS: Acquired Immune Deficiency Syndrome; Illovo: Illovo Sugar, Ltd.; SUN: Scaling Up Nutrition; NNPSP: National Nutrition Policy and Strategic Plan.

Although broad hunger and malnutrition problems had been recognized in Malawi since the 1940s through various localized studies, the vitamin A challenge and its seriousness were only brought into policy discussions in Chikwawa and Ntcheu after the 1983 study by Tielsch et al. (1986). In the early 1990s, the momentum gained through international efforts to eliminate VAD brought donor resources to vitamin A supplementation programs. The fortification discussion also began in the mid-1990s; for the first time, a National Micronutrient Committee was formed to address MDD in Malawi. This helped in the national-level discussions of vitamin A fortification as well.

The 2001 drought and the announcement of the food crisis in Malawi by President Bakili Muluzi retriggered malnutrition discussions. Micronutrient malnutrition became a topical issue once again due to a localized survey conducted by Save the Children, which supported further discussion on the need for a national micronutrient survey. Once the survey was conducted, its results helped jump-start the fortification of sugar in the early 2000s. (Further details are provided in the discussion of sugar fortification.) However, attempts to mandate fortification of sugar for vitamin A were not successful due to objections from the only sugar company in Malawi—Illovo Sugar. Illovo was concerned about the increased cost of sugar production.

In the mid-2000s, efforts to introduce crops such as OFSP and breeding maize, which were both fortified with vitamin A, began in Malawi. The second National Micronutrient Survey results, published in 2009, confirmed that although severe VAD had declined, there were still widespread moderate levels of VAD. Throughout the 2000s, DNHA continued to work with Illovo and donors to remove the impediments for sugar fortification. Illovo began voluntary sugar fortification for vitamin A in the 2012/13 season. Fortification of vitamin A for processed foods such as sugar, oil, wheat flour, and maize meal was gazetted in early 2015.

There are some interesting questions resulting from this chronology of sugar fortification: Why did Malawi take almost 20 years to make sugar fortification a law? And, what challenges in the policy process influenced this delay, despite continued pressure from the government and donors to fortify sugar? Next we analyze the drivers of the policy process in the context of three approaches to VAD in Malawi: supplementation, fortification, and biofortification. Table 4.6 provides a summary of the roles and influence of various stakeholder groups in the development and implementation of VAD interventions.

Table 4.6 Vitamin A policy stakeholder inventory in Malawi

Institution	Category	Role	Resources	Influence	Policy stance
OPC		• Overall responsibility for the welfare of Malawians • Housed DNHA • Nutrition coordination until 2014		• Large	Supportive of Part of DNHA during Bingu Decline during Banda Moves nutrition out during Mutharika
MoH	Government	• Issue regulations • Enforcement • Education • Manage public health campaigns • Implement public health programs	• Limited but supported by development partners	• Large	• Champions all forms of vitamin A fortification, supplementation, and biofortification
DNHA	Government	• Identify key issues and policy options • Monitor implementation • Advise MoH and GOM	• Limited	• Large	• Champions all forms of vitamin A fortification, supplementation, and biofortification
NFA	Government / Private sector / Donors/ Research groups	• Identify fortification opportunities • Monitor the progress in fortification implementation	• Mostly donor supplied	• Large	• Champions for fortification
MBS	Government	• Set standards and testing protocols	• Limited	• Large	• Neutral
CHISU	Government	• Tests samples • Participates in NFA meetings • Reports on the status of monitoring	• Limited	• Limited	• Neutral
Ministry of Industry and Trade (MoIT)	Government	• Enforces fortification of sugar, working with MBS import ban on sugar	• Limited	• Large	• Generally supportive of all policies coming out of DNHA
MoA/DARS/FNO	Government	• Crop breeding for biofortification • Promotes dietary diversity through nutrition extension	• Limited	• Large	• Champions biofortification
CSONA	Network of NGOs working on Nutrition	• Monitors the level of funding for nutrition policies and programming	• Limited	• Limited	• Champion
Parliament	Legislature	• Passes legislation • Monitors competition	• Limited	• Large	• Approves budget • Parliamentary committee on nutrition

Table 4.6 Continued

Institution	Category	Role	Resources	Influence	Policy stance
Unilever	Private sector	Oil fortification in early days	• Limited	• Limited	• Not a key player
Rab Processors	Private sector	Produces Likuni Phala	• Limited	• Limited	• Not a key player
Illovo Sugar Ltd.	Private sector	• Produces over 90 percent of Zambia's sugar • Fortifies sugar	• Large	• Large	• Following initial opposition, Illovo now supports vitamin A fortification
UNICEF	Donor	• Funds studies • Funds testing • Funds education • Technical assistance	• Large	• Large	• Champions all forms of vitamin A supplementation, fortification and biofortification
USAID	Donor	• Funds studies • Funds testing • Funds education • Technical assistance	• Large	• Large	• Champions all forms of vitamin A supplementation, fortification and biofortification

Source: Authors' compilation.

Notes: OPC: Office of the President; DNHA: Department of Nutrition, HIV, and AIDS; MoH: Ministry of Health; NFA: National Fortification Alliance; MBS: Malawi Bureau of Standards; CHISU: Central Health Information Services Unit; MoIT: Ministry of Industry and Trade; MoA: Ministry of Agriculture; DARS: Department of Agricultural Research Services; FNO: food and nutrition officer; CSONA: Civil Society Organisation Nutrition Alliance; NGOs: nongovernmental organization; UNICEF: The United Nations Children's Fund; USAID: United States Agency for International Development.

Institutional Mapping of the Vitamin A Policy Process

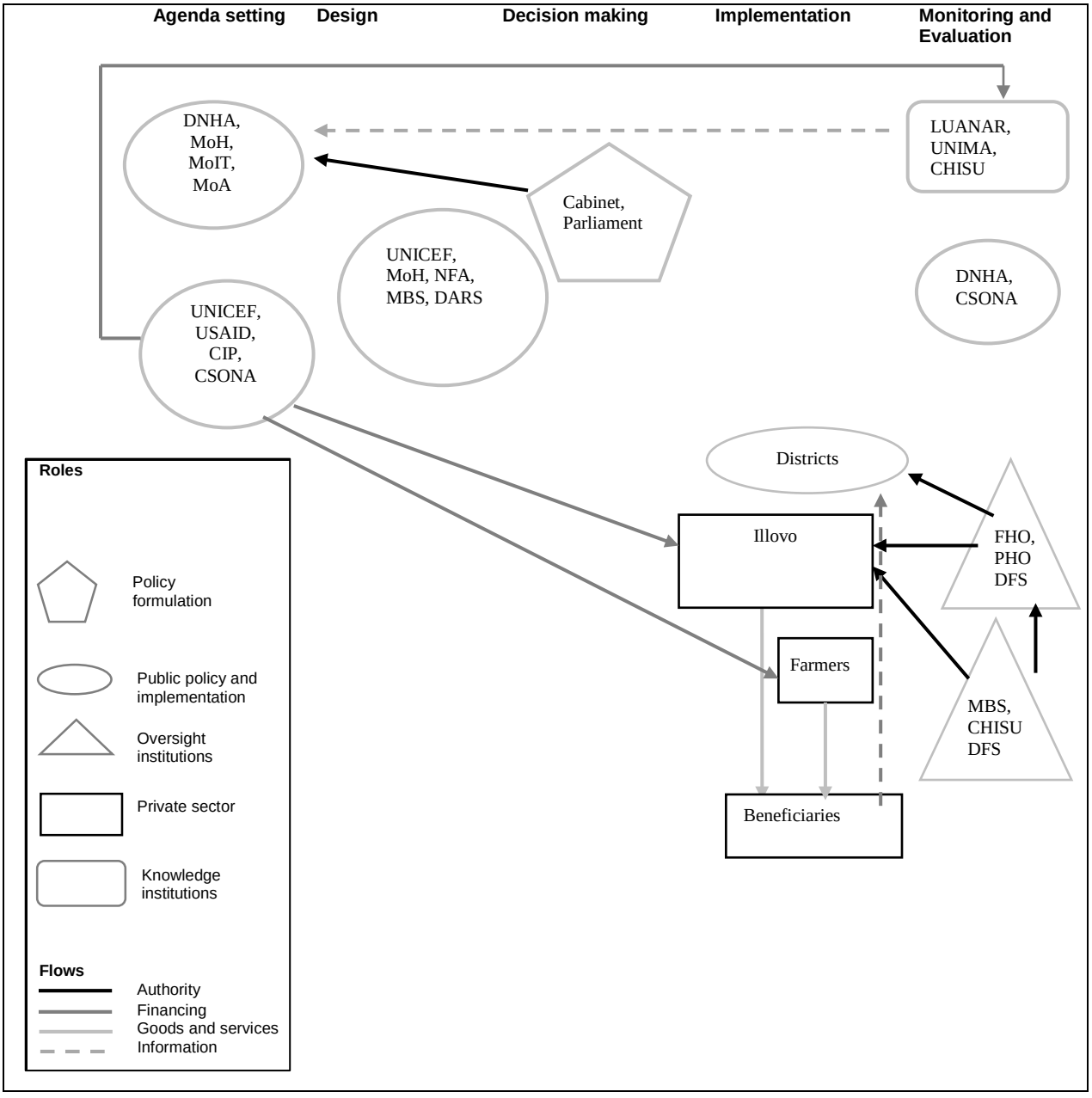
Each approach to vitamin A policy and program intervention has a set of institutions that collaborate to reach the final beneficiaries. The supplementation approach, which began in the 1990s, was largely an attempt to quickly translate the international VAD elimination goals into national strategies. UNICEF and USAID supported vitamin A supplementation through district health offices and voluntary health workers, using the existing logistical mechanisms in the MoH for implementation. The approach and the implementation process continued, though this process was further intensified through Child Health Days. In addition, the district commissioner's involvement in implementation and monitoring, working closely with the district health officers, had a major role in intensifying the process. The district health officers work at the primary health care centers and with the communities to reach pregnant women, lactating mothers, and children under 5. These are also the key targets for the supplementation approach. Recently, the SUN movement has provided additional momentum through mobilization of donor funding for this purpose.

The fortification approach to vitamin A policy programs involves donors—in particular, UNICEF and government ministries, such as MoH and the Ministry of Industry and Trade (MoIT). The fortification standards are mandated through MBS, which is responsible for the specification and implementation of standards. MoIT is responsible for monitoring fortified foods. Food is tested at various stages of the micronutrient chain to check for the appropriate fortification levels; these tests are conducted at laboratories located in CHISU, which is part of MoH. The NFA provides a platform for the institutions involved in the design and implementation of the fortification approach to discuss the results of monitoring efforts and to identify the challenges and solutions for continued implementation of vitamin A fortification.

The biofortification approach to solving VADs involves the Department of Agricultural Research Services (DARS) in the Ministry of Agriculture, Irrigation, and Water Development (MoAIWD). DARS is mandated to undertake agricultural research to address food and nutrition problems in Malawi. MoAIWD, which is part of the national nutrition committee, is responsible for the biofortification aspects

of the National Micronutrient Strategy. This department implements research through its research stations in collaboration with key CGIAR institutions operating in Malawi, such as CIMMYT, the International Potato Center (CIP), and CIAT. DARS works with MoAIWD and the district-level extension system for dissemination of biofortified technologies. Figure 4.3 presents the institutional mapping of Malawi's vitamin A policy process.

Figure 4.3 Institutional mapping of Malawi's vitamin A policy process



Source: Authors.

Notes: DNHA: Department of Nutrition, HIV, and AIDS; MoH: Ministry of Health; MoIT: Ministry of Industry and Trade; MoA: Ministry of Agriculture; UNICEF: The United Nations Children's Fund; NFA: National Fortification Alliance; MBS: Malawi Bureau of Standards; DARS: Department of Agricultural Research Services; LUNAR: Lilongwe University of Agriculture and Natural Resources; UNIMA: University of Malawi CHISU: Central Health Information Services Unit; CSONA: Civil Society Organisation Nutrition Alliance; USAID: United States Agency for International Development; CIP: International Potato Center; FHO: Food Hygiene Officer; PHO: Port Health Officer.

Vitamin A Supplementation in Malawi

In the early 1990s, Malawi was quick to adopt the supplementation approach to eliminate VADs, right after the nation became signatory to the World Summit for Children and the commitments made during ICN1. In addition, various development partners showed abundant support for this intervention. USAID offered financial support to UNICEF to provide the assistance MoH needed to distribute vitamin A supplements to women and young children during antenatal clinic visits. The biannual Child Health Days began in 2005, and the vitamin A supplementation program expanded its coverage through social mobilization campaigns. All of this was possible after DNHA's move to OPC, as resource mobilization and coordination became easier. Donors collectively supported this expanded coverage. Severe VAD declined considerably by 2009 (Appendix Table A.2); however, moderate VAD remained at a high level.

Along with vitamin A supplementation, other interventions were also implemented, such as growth monitoring and immunization, deworming, and family planning advice. In 2010, the donor community initiated the SUN movement, and Malawi was recognized as an Early Riser for the initiative. This recognition helped mobilize donor resources and focused on targeted districts. Both the Child Health Days and the SUN initiative helped increase coverage of the vitamin A supplementation. However, due to logistical difficulties, supplementation programs have not reached all vulnerable groups of Malawi. The recent NMS indicates that the supplementation program's efficiency has been affected by malaria infections, which are common in Malawi. Recently, the dosage of vitamin A through supplementation has been under serious consideration for revision, as children get the supplements only twice a year. In addition, if sugar fortification is implemented, as planned, this may increase vitamin A coverage throughout Malawi.

Sugar Fortification for Vitamin A in Malawi

Agenda Setting

VAD was recognized in Malawi even before such global events as ICN1 and the World Submit for Children. However, MDD gained momentum in the health policy circle after these two major events, which called for virtual elimination of VAD. In the mid-1990s, MoH, with the help of UNICEF, was already distributing vitamin A supplementation through primary health care facilities to benefit pregnant and lactating mothers and children below 5 years of age. With the help of donors, this activity still exists under the purview of MoH.

As described in the policy chronology section for sugar fortification with vitamin A, the pivotal events for the choice of sugar fortification can be identified. After the global call for the elimination of VAD and related blindness during ICN1, each UNICEF country and regional offices in Africa followed up with national governments to develop national nutritional plans of action. Following the global events, several meetings were held to develop the National Plan of Action for Nutrition in the early 1990s. These meetings were organized largely under FSNU, which is part of the Economic Planning and Development Ministry. Representatives from donors, sectoral ministries including MoH and the Ministry of Agriculture, and researchers from Bunda College and the University of Malawi's Centre for Social Research attended these meetings. It should be pointed out that Victoria Quinn (now vice president of Helen Keller International) was posted from Cornell University to Malawi to serve as the senior technical adviser to FSNU. Funding from UNICEF supported the meetings. MDDs were discussed as part of the larger discussions on food and nutrition security (Quinn 1994). These meetings were necessary and instrumental in making micronutrient challenges relevant problems in Malawi.

In the context of VAD, as the policy chronology shows, global events also helped identify local champions and powerful advocates through the formation of multisectoral committee for MDDs in 1996. In the FSNU, Mabel Chiligo was the senior nutritionist and Ruth Ayoade held the same position in the Ministry of Agriculture; both of them jointly began advocating for nutrition policy in the early 1990s. This local team in the government was supported by nutritionists in the donor agencies—in particular, Lilian Selenje of UNICEF, who had been a former senior nutritionist in MoH, and Beatrice Mtumuni, senior lecturer for nutrition at the Bunda College of Agriculture (now LUANAR). In addition, the director

of the Centre for Social Research was Luis Musukwa, who had been very vocal in the late 1980s and who continued to support the evidence generation potential in the 1990s. The vice president of Malawi finally approved the National Plan of Action for Nutrition in 2000.

Fortification of processed foods appeared in Malawi's policy discussions in the mid-1990s, though no serious effort was made to standardize the process until the early 2000s. The discussion about alternative strategies, such as fortification, possibly began due to poor coverage of the supplementation approach, because of the limited reach of the health care facilities. The fortification of sugar as a vehicle, however, was pushed in Malawi after results of the 2001 National Micronutrient Survey, making it the most recognized locally focused event that triggered the fortification discussion. In addition, in 2003, a regional proposal through ECCSA for micronutrient fortification was pushed by regional offices of UNICEF and USAID. The 2001 National Micronutrient Survey showed that, although the supplementation of vitamin A covered children under 5 years and women, VAD was prevalent among men. The survey also showed that more than 70 percent of Malawian households consumed sugar. Hence, policy discussions focused on the universal fortification of sugar.

Even before the 2001 micronutrient survey and the 2003 push from ECCSA for fortification, intermittent discussions were held between MoH/UNICEF and the sugar industry. Several of these discussions held between 1996 and 2001 resulted in no meaningful agreement, mainly because of resistance from the sugar industry. During these discussions, Illovo expressed concerns about the feasibility of fortifying sugar with vitamin A. The company's concerns included technical issues related to the quality and stability of vitamins in sugar and of the effect of fortified sugar on the competitiveness of the sugar. It is worth noting that these concerns were raised even after Illovo's sister company in Zambia had already started fortifying sugar in May 1998 (see Haggblade et al. 2015).

The discussions in the early 2000s revolved around universal fortification of sugar with vitamin A because the deficiency levels were similar in both rural and urban areas. Although the choice of salt as a medium for vitamin A was also discussed, it was quickly rejected due to the high cost of fortifying salt. Other media such as oil and maize meal were also discussed. Although oil would be the cheapest way of providing vitamin A, its accessibility by the rural population and the poor in urban areas continues to be low. Maize meal processing also was not appealing, as it required a central processing facility. Furthermore, Malawians do not consume processed maize meal as do other countries of eastern and southern Africa. Most of the maize meal eaten by Malawian households is hand processed or processed locally in hammer mills. Thus, sugar became the accepted medium for vitamin A fortification.

Although the National Plan of Action identified micronutrient deficiency, which helped continue the supplementation of vitamin A, the fortification for vitamin A only became more prominent in policy discussions after the first National Micronutrients Survey in 2001. The survey results showed that 60 percent of children under 5 years and 38 percent of school-going children had VAD, despite several years of vitamin A supplementation. In addition, the results showed that 57 percent of women of childbearing age were deficient in vitamin A (Appendix Table A.2). This evidence, along with the declaration of the food crisis in Malawi after the 2001 drought, gave local champions the opportunity to take up the issue of micronutrient deficiency. This movement was reinforced by local champions within the government, such as DNHA and MoH, and donor organizations, such as USAID, UNICEF, Save the Children, and Irish Aid. These groups collectively continued to support the multisectoral committee on MDD, while also becoming powerful advocates for micronutrient policy.

The momentum generated by the President Muluzi's 2001 announcement of the food crisis and the localized survey by Save the Children was further expanded through the National Micronutrient Survey results. DNHA and MoH effectively used this momentum to help place micronutrients on the policy agenda.

Bingu wa Mutharika, the ruling party candidate during the 2004 elections, was supported by President Muluzi, the outgoing president, who was finishing up two terms in office. In his first term in office, President Bingu, as part of establishing his leadership and demonstrating his commitment to smallholder farmers, introduced a fertilizer subsidy program; this program was credited with the food surplus of 500,000 metric tons in the 2005/2006 crop season. He also focused on improving major road

infrastructure through another major presidential initiative. Although controversial, the high-profile fertilizer subsidy intervention showed that Malawi could achieve food self-sufficiency and could also export maize to neighboring countries. This was seen by Malawians as a matter of national pride and served as a morale booster to society, which was vulnerable to frequent droughts and had depended on food aid and commercial imports for several decades.

In the meantime, nutritionists in the country were also concerned with the population affected by HIV/AIDS. The HIV/AIDS Agriculture Sector Policy and Strategy came out in 2003. The food security and nutritional status of the HIV/AIDS-affected population became a major concern for the government. In addition to the National Micronutrient Survey results, the need to improve nutritional status in the context of HIV/AIDS made micronutrient deficiencies a pressing problem.

Design

At the design stage of the fortification strategy, discussions revolved around the merits and demerits of fortification versus supplementation, the latter of which was already on the ground but with limited success. Designers of the fortification strategy considered supplementation as a short-term solution. However, they deemed it unsustainable without donor support and felt that it covered only the vulnerable population of pregnant women, lactating mothers, and children under 5 years of age, while excluding other segments of the population that also suffered from VAD. The coverage was poor, and the logistics for distribution had their own challenges due to the poor commitment of staff along the distribution channel. They also considered other processed foods as possible vehicles for vitamin A fortification. Salt was considered to be inappropriate, while maize meal was rejected because it was not centrally processed in Malawi and could thus pose serious logistical challenges. According to MBS, formal processors mill only 3 percent of the maize meal consumed in Malawi; therefore, fortification by these few firms would have minimal impact on VAD. Biofortification and diet diversification are the most effective long-term solutions. However, these interventions will take a long time to implement, and consumers need to eat more nutrient-rich diets, such as fruits and vegetables. Finally, information on the impact of fortification versus supplementation is not available due to the lack of literature on the differential cost effectiveness of the two strategies.

DNHA designed Malawi's sugar fortification policy in close collaboration with and technical assistance from UNICEF. Although there were initial discussions between members of the multisectoral committee on MDDs between 1996 and 2001, these discussions did not result in agreement on any specific design of fortification, mainly due to Illovo's initial resistance. The company did not want to get involved in a program for which they would incur a cost, nor did they want to be accountable to the government. This disagreement became a serious concern for the government, particularly the MoH and MoIT. The complaints of the sugar company are discussed below.

During the design stage, there was a prolonged discussion of sugar as a vehicle for vitamin A delivery. Although micronutrient deficiencies were recognized as a major concern based on the 2001 National Micronutrient Survey results, there was considerable discussion among the members of the MMD committee about various possible interventions. In the context of vitamin A, the search was for a processed food that could reach most of the Malawian population. There was also concern about the costs involved in fortification of processed foods. These criteria led to sugar becoming the choice of crop for fortification. The discussions with Illovo that began in the mid-1990s were revived in the context of micronutrient interventions through fortification. The National Micronutrient Committee discussed the costs and benefits of various carriers for fortification; they concluded that the cost of fortification through sugar was the most effective and would only increase the price of sugar by 1–2 percent. Sugar fortification also had full support of the donor community. The 2001 National Micronutrient Survey showed that 70 percent of Malawian households consumed sugar. Both UNICEF and MoH became strong advocates for sugar as a medium for providing vitamin A. In 2002, MBS set the standards for vitamin A in sugar and prepared draft legislation. Thus, it became an official policy of the government that all sugar sold in Malawi should be fortified with vitamin A.

The sugar fortification design was chosen with the belief that all Malawians have a right to adequate food and a healthy life. It was believed that "all Malawians must work to achieve this, including the private sector" (Geoff Mkandawire 2015). The design and its implementation, however, depended solely on the acceptance and compliance of the only sugar company in Malawi that produced and distributed sugar—Illovo.

Decision Making

After DNHA made the final decision to go ahead with the fortification of sugar, MoH and UNICEF worked together to develop the standards for sugar fortification. The assumption was that Illovo would start sugar fortification on a voluntary basis until the process became mandatory through legislation and a gazette.

DNHA worked with MoIT to issue a notification to Illovo in August 2003 for the fortification of sugar with vitamin A. Since this decision was not binding, however, the management of Illovo "expressed serious concern on how a government order/notice could have been drafted without consulting the industry" (Geoff Mkandawire 2015). Thus, Illovo raised a strong objection to MoIT's notification. The company was skeptical at first and opposed the initial fortification plan, which had been prepared without industry consultation. Gradually, however, Illovo was persuaded by the three studies commissioned to address their concerns. UNICEF and DNHA sent Illovo on two study tours to Zambia and Guatemala to meet with processors there who were fortifying sugar.

UNICEF also lobbied the president of Malawi to overturn the MoIT ruling and got his support. The final decision to proceed with sugar fortification was arrived at by donors and DNHA, who agreed to work together to address Illovo's concerns during the implementation process.

In summary, heavy lobbying by UNICEF, plus the president's veto power, helped in the decision making. The relative powers of proponents and opponents played out in the decision-making process. Donors exercised considerable power and influence, while the industry interests proved surprisingly weak. UNICEF was a more powerful lobbying force than both industry and the minister of agriculture combined.

Implementation

Implementation of the sugar fortification decision faced major challenges. Illovo's reluctance to voluntarily initiate sugar fortification, even with assured initial support for equipment, fortification materials, and training, was a major setback for the government of Malawi in addressing VAD. Although the decision to fortify sugar was made and MBS had drafted the standards for legislation, Illovo claimed that it was not fully informed of the process by which the standards were developed.

In response to industry concerns, donors and DNHA implemented several conciliatory measures. DNHA, UNICEF, Irish Aid, and USAID commissioned three studies in 2007/08 to address the major industry concerns—namely, the stability of vitamin A in sugar; the effect of fortification on taste, quality, color, and consumer acceptance; and the economics of fortification (How much would it add to the cost? Would consumers be willing to pay?). The sugar company officials and the staff of DNHA were sent on a study tour to Guatemala to gain an understanding of the process of sugar fortification. This helped convince the sugar industry officials.

The process of convincing Illovo to take on fortification responsibilities was slow and gradual at best. The fortification trials started at Illovo in 2008, after the three studies established the feasibility of the process. In 2012, voluntary standards were produced, and in 2015, fortification was mandated. The implementation of sugar fortification by Illovo was brokered and mediated by UNICEF and its consultant, Philip Makhumula. The negotiations resulted in the commitment of donors to support the company for an initial period of three years. Donors purchased the initial equipment (750 million Malawian Kwacha) and committed to sponsoring the first two years' worth of fortificants. Illovo would then have to pay for these costs in the subsequent years. However, Illovo candidly declared that it proposed to transfer the costs to the consumers.

In summary, during the process of implementation, although Illovo was responsible for fortification, MBS was made responsible for conducting tests to enforce standards. The NFA has been entrusted with the responsibility for the subsequent review of implementation and monitoring results and any changes in the policies (NMS 2013). Any revision of the standards (currently under initial discussion) due to availability of vitamin A through multiple channels in the near future will also be the responsibility of NFA. The current challenge, however, is the institutional capacity of implementing the monitoring of vitamin A content in fortified sugar at various stages of the distribution system. The institutional infrastructure for implementing laboratory tests continues to depend on USAID funding on an annual basis. There is a need to build local capacity to ensure that the process of sugar fortification is sustainable. These concerns were raised by the CHISU officials during our interviews.

Monitoring, Evaluation, and Reform

Illovo expresses that the government has transferred the responsibility of solving VAD problems solely to the private sector, with consumers bearing the burden of costs. Government officials, however, see this as a medium-term solution until all Malawians are able to afford a diversified diet. They also see this as only one of the multiple interventions needed to address MDD in Malawi. From the donor perspective, this is a cost-effective intervention, regardless of whether they have to pay for it initially in terms of technical advice, training, equipment, and monitoring support. Donors also see it as a more sustainable solution, as it is internalized within the country's legislation.

There is a current need to evaluate the costs and benefits of the micronutrient intervention programs, including the sugar fortification approach. The government of Malawi stopped paying for the fortificants due to budget constraints. However, the fortification of sugar and other major processed foods, such as oil, wheat flour, and maize meal, has been gazetted and made law. Thus, violation or noncompliance of the fortification mandate are punishable by law. Yet the monitoring system for checking nutrient content in processed foods continues to depend on donor funding.

There is an increasing awareness that vitamin A reaching households could be more than needed. However, this is yet to be confirmed by field studies. Currently, DNHA is responsible for the fortification policy, and it operates through a multistakeholder platform in the form of the NFA.

The "sugar fortification" section of the latest NFA meeting minutes illustrate the current status of sugar fortification. The representatives of Illovo participated in the March 2015 meeting. According to the minutes (NFA 2015), the Illovo representative stated that fortification of sugar with vitamin A had begun in 2012 and that currently 89 percent of its sugar is fortified. This sugar is mainly for household consumption, with the other 10 percent for industrial use. Illovo also informed members that the sugar for household consumption has the fortification logo and the industrial sugar did not and that the packaging for both is different (the industrial sugar packaging has a stripe on it). However, NFA members expressed concern that sugar for industrial use, which is mostly sold in 50-kg packets, was being repacked and sold for consumption in rural areas. Illovo also stated that it is planning to start packaging sugar in 500 g and 250 g to ensure that sugar, which is normally repacked, still has vitamin A. Some of the action points of the meeting included NFA would send a proposal to Illovo for support of a fortification awareness program, Illovo would consider putting the fortification logo in front of the packet and not behind, and Illovo would consider including the word "not fortified" on packages for industrial sugar. Table 4.7 gives the evolving sugar fortification mandate in Malawi.

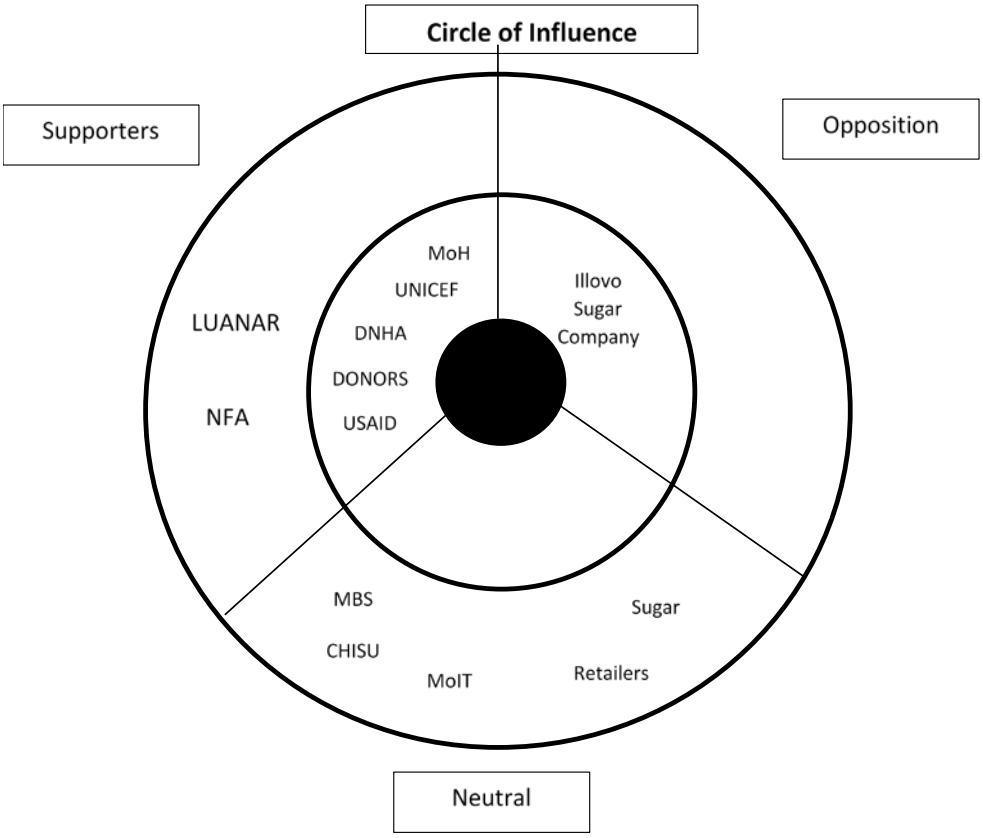
Table 4.7 Evolving sugar fortification mandate in Malawi

Key years	1996	2002	2012–2015
Statutory instruments	Initial discussion with Illovo Sugar for sugar fortification with vitamin A	MBS prepares draft sugar fortification standards and prepares it for gazetting	May 2015: sugar fortification standard is gazetted
Requirement	None mentioned	Standard specified but not implemented	Becomes mandatory as part of the larger push for fortification of major processed food, including oil, sugar, wheat, and maize flour
Point of inspection	Not inspected	Not implemented	Factory Retail Household (survey)
Fortification level (vitamin A mg/kg)	Not specified	Not known	15 mg/kg at production level 6 mg/kg at retail marketing level
Enforcement agency	None	• MoH/CHISU • MoIT • DNHA • MBS • NFA	• MoH/CHISU • MoIT • DNHA • MBS • NFA (quarterly monitoring of sugar by MBS at the factory and reporting to NFA (2015)
Enforcement level and challenges	Not enforced	Not applicable	Moderate Equipment and resources not adequate NFA reviews the results from monitoring sugar

Source: Authors' compilation.
Notes: MoH: Ministry of Health; CHISU: Central Health Information Services Unit; MoIT: Ministry of Industry and Trade; DNHA: Department of Nutrition, HIV, and AIDS; MBS: Malawi Bureau of Standards; NFA: National Fortification Alliance.

Based on the previous discussion and the hypothesis testing of the kaleidoscope model, the sugar fortification circle of influence in Malawi is presented in Figure 4.4.

Figure 4.4 Vitamin A sugar fortification circle of influence in Malawi



Source: Authors' field interviews.
Notes: LUANAR: Lilongwe University of Agriculture and Natural Resources; NFA: National Fortification Alliance; MoH: Ministry of Health; UNICEF: The United Nations Children's Fund; DNHA: Department of Nutrition, HIV, and AIDS; USAID: United States Agency for International Development; IIIovo: Illovo Sugar, Ltd.; MBS: Malawi Bureau of Standards; CHISU: Central Health Information Services Unit; MoIT: Ministry of Industry and Trade

Biofortification for Vitamin A in Malawi

Biofortification of crops for major micronutrients has been recognized as a key component in the recent National Nutrition Policy 2013–2018 (GoM 2013). In the aftermath of the 2001 Micronutrient Survey Results, there was a need to search beyond the short-term supplementation solution and the medium-term food fortification solution to MDD. The DARS of MoAIWD (then the Ministry of Agriculture and Food Security) began working with CIP in the mid-2000s to explore breeding sweet potatoes for high vitamin A content. CIP's Vitamin A for Africa program was instrumental in providing vitamin A–rich breeding lines. At that same time, similar efforts were undertaken in other eastern and southern African countries. Around 2007, breeding for vitamin A–rich sweet potato varieties began in Bvumbwe research station in Blantyre, Malawi. The initial breeding, development, cultivations, and dissemination were undertaken under the Irish Aid–funded OFSP project, which was jointly implemented by CIP in partnership with Malawi's national sweet potato program and three NGOs—Concern Universal (in Dedza, Phalombe, and Mulanje districts), the Millennium Villages Project (in Zomba district), and the Catholic Development Commission (in Chikwawa district) (Abidin et al. 2013).

Sweet potatoes were a preferred choice for several reasons. First, several parts of Malawi—in particular, the lake shore areas with their sandy soils—were used to grow sweet potato, but mostly as a drought-resistant crop when the cassava crop failed. Second, it is the most commonly consumed food in rural areas after maize and cassava. Third, the leaves of the sweet potato plant, which could be used as a

green leaf vegetable during the lean season, contain 4 percent protein. Fourth, just 100 g of OFSP is enough to meet the vitamin A requirement of a young child. Finally, sweet potato can be grown twice a year, thus increasing the food availability at the household level. During the drought years of the early 1990s, a major project supported by USAID helped distribute sweet potato vines, which was a useful introduction to drought-resistant crops in vulnerable regions of Malawi.

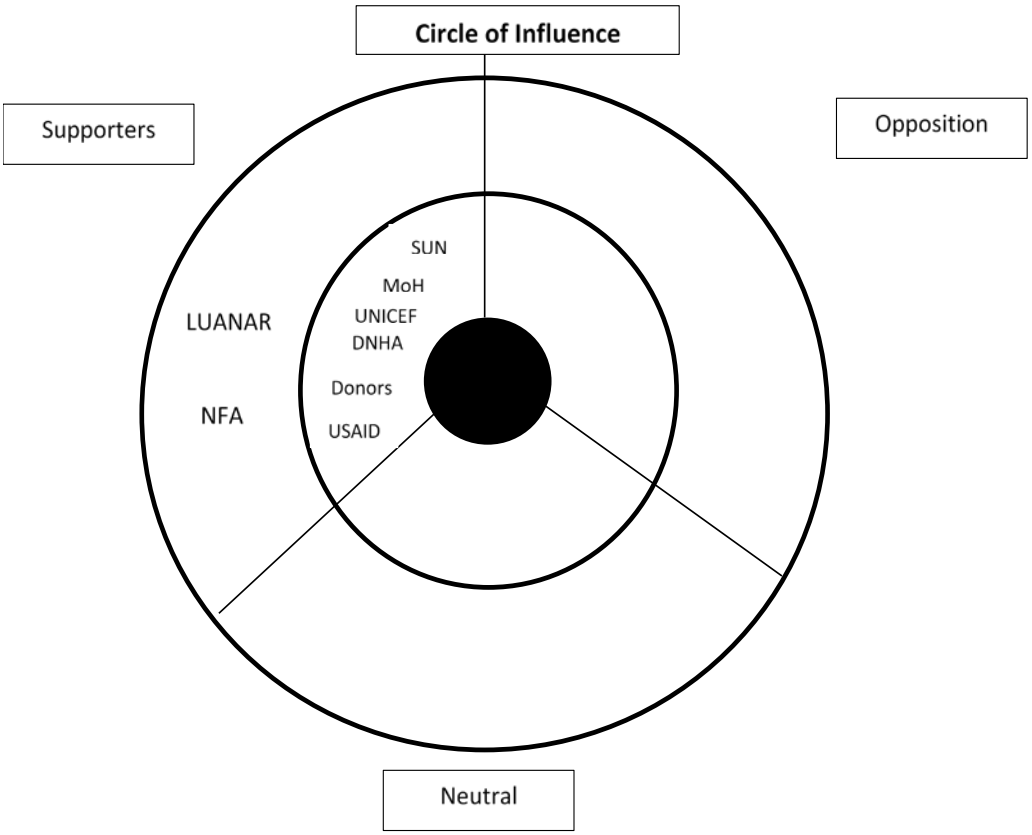
With the project's help, the Malawi national program released six vitamin A–rich OFSP varieties by the end of the project's third year and started distributing the planting material with the help of partner organizations. One particular variety of OFSP named Zondeni was developed in 2008 and, after being screened for viruses, was widely distributed. Under the best crop production conditions, this variety can yield up to 18 tons of OFSP per hectare (Abidin et al. 2013). CIP and the national program have built a network of decentralized distribution systems by working in partnership with a wide range of national and international NGOs to provide the OFSP planting materials (CIP 2012). The varieties developed by the OFSP project have been widely adopted under the SUN initiative in Malawi, as part of SUN's 1000 Special Days initiative, which concentrates on child nutrition from the conception of the child to age 2 years (CIP 2012).

The use of biofortification as a strategy came to the policy discussions as part of the search for long-term solutions to MDD in Malawi. The external research community—CGIAR, in this case—supported the mobilization of knowledge and developed regional partnerships to initiate the development of the OFSP varieties. The program has been successful in getting vitamin A–rich OFSPs to farmers within short periods of time. The approach has been adopted as a strategy in the latest National Nutrition Program partly due to the success of the spread of OFSPs in Malawi. Furthermore, the National Micronutrient Strategy also recognizes biofortification as a long-term solution to MMD (GoM 2013).

The lessons learned from the OFSP project show that the development of strong partnerships with the national system is key for developing ownership of and expanding the program. Training of local professionals both in the national system and in NGOs is important for the quick development and dissemination of OFSP varieties among farmers. Developing a decentralized seed distribution system to increase access to planting material, conducting regular training programs at all levels (including at the farm level through field days), creating demand for OFSPs though special campaigns, and linking the production activities to postharvest, use, marketing, and nutritional benefits has helped the OFSP project to become a successful intervention for combating VAD in Malawi (CIP 2012).

The NMS also recognizes the biofortification of maize for vitamin A as a strategy (GoM 2013). However, the breeding activities in Malawi are at the beginning stage; Malawi is considered a spillover country for the orange maize development in Zambia. (See Haggblade et al. [2015] for details on Zambian efforts in orange maize development.) Figure 4.5 presents the vitamin A supplementation circle of influence in Malawi.

Figure 4.5 Vitamin A supplementation fortification circle of influence in Malawi



Source: Authors' field interviews.
Notes: LUANAR: Lilongwe University of Agriculture and Natural Resources; NFA: National Fortification Alliance; SUN: Scaling Up Nutrition; MoH: Ministry of Health; UNICEF: The United Nations Children's Fund; DNHA: Department of Nutrition, HIV, and AIDS; USAID: United States Agency for International Development;

Table 4.8 provides a summary of the hypothesis testing of the kaleidoscope model for supplementation, fortification, and biofortification. In the case of supplementation, agenda setting was highly influenced by global events and the translation of global goals by local donors, who fully supported supplementation using the existing MoH distribution infrastructure. The design was fully influenced by the external design of vitamin A supplementation in other developing countries that had implemented similar interventions. Adoption was not a challenge, as the benefits were fully understood by a key set of policy makers and costs were covered by donors. Implementation, however, depended on the local infrastructure, which remains weak, showing some improvement recently with the introduction of Child Health Days. However, the supplementation of vitamin A still depends on donor funding and may face significant setback if donors withdraw support. Changing the beliefs of policy makers about the need for long-term solutions has moved them toward industrial fortification of processed food commonly consumed by Malawians and toward biofortification of crops.

Table 4.8 Vitamin A policy hypothesis testing

Policy stages	Supplementation	Sugar fortification	Biofortification	
Kaleidoscope hypotheses	Children (6–59 months) and lactating mothers		Sweet potato	Maize
1. Agenda setting				
1.1. Powerful advocates	+++	++	+	
1.2. Focusing event	+++	+	+	+
1.3. Recognized, relevant problem	++	++	+	+
2. Design				
2.1. Pressing versus chosen problem		++	++	+
2.2. Ideas and beliefs			+	+
2.3. Cost-benefit calculations	+	+ +++	+	+
2.4. International design spillovers				
3. Adoption				
3.1. Propitious timing		+++		
3.2. Veto players	+	++		
3.3. Relative power: proponents versus opponents		+	+	+
4. Implementation				
4.1. Institutional capacity	+	-	+	+
4.2. Requisite budgetary allocations	-	+	+	+
4.3. Commitment of policy champion	+	+++	+	+
5. Evaluation and Reform				
5.1. Changing conditions				
5.2. Changing information or beliefs	+	+ +	+	+
5.3. Resources available relative to costs			++	+

Source: See Appendix Table C.2 for details.
Notes: + = significant positive impact of this variable on policy outcomes; - = significant negative impact of this variable on policy outcomes.

Efforts to fortify sugar with vitamin A have had a long gestation period due to objection from the sugar industry. The move toward sugar fortification had strong champions and advocates. Sugar was the chosen crop because of the poor coverage of other alternatives, results from supplementation, and the first micronutrient survey. Costs and benefits were favorable and sustainable in the long run, though initial support was expected from donors toward equipment and supply of fortificants. For the implementation of sugar fortification, there is high knowledge spillover and learning from the experience of other countries that have done the same. However, implementation continues to have challenges in terms of monitoring and quality control. Although several processed foods are now under a fortification mandate by gazette, food processors other than sugar are not fully equipped to implement fortification. The commitment of local champions continues to play an important role for fortification. Currently, there is some reconsideration of the levels of fortification of micronutrients, as the channels through which micronutrients can reach the population have increased.

There has not been any opposition to biofortification. It has the support of policy makers because it is deemed to be a long-term sustainable approach. The support of international agricultural research groups for the development of vitamin-rich crops and that of NGOs for the multiplication and distribution of planting materials has been fully recognized and is effectively used by the national systems.

Iron

Iron deficiency anemia (IDA) continues to be a major micronutrient public policy concern for Malawian policy makers. The latest draft of the National Nutrition Policy 2016–2020 (GoM 2016) indicates that "iron deficiency coupled with the high malaria burden contributes to very high prevalence of anemia, especially among women." This section looks at the policy process of supplementation and biofortification for iron and applies them to test the hypotheses of the kaleidoscope model.

Policy Chronology

Researchers in Malawi have raised their concerns with IDA since the 1970s, when results of localized nutrition surveys began to appear. In the mid-1980s, UNICEF's regional office presented international evidence for addressing nutrition problems, including MDD. The momentum for addressing IDA came in the early 1990s as part of the global goals for its elimination. At the national level, donors—specifically, UNICEF—mobilized resources to initiate iron supplementation for pregnant mothers and adolescent girls through schools. UNICEF used the distribution infrastructure of MoH to distribute iron supplements. However, due to poor coverage and noncompliance to suggested intake of iron supplements, the expected results were not achieved. In the mid-1990s, a micronutrient committee was formed. The first National Micronutrients Survey in 2001 showed high levels of IDA. In the early 2000s, DNHA and UNICEF, along with other stakeholders, supported the expansion of the coverage of iron supplementation. In 2005, Child Health Days were introduced, during which children were mobilized and brought to health camps for supplementation. The discussion of fortifying processed food with micronutrients, including iron, continued in the 2000s with the government, donors, and NGOs trying to persuade food processors to undertake fortification voluntarily.

In 2015, these efforts resulted in a gazette for micronutrient fortification of key processed foods (wheat flour, maize meal, corn-soya blend, oil, and sugar). The evolution of a fortification mandate for iron is given in Table 4.9. In the mid-2000s, CIAT began its collaboration with the National Bean Research Program to develop iron-rich bean varieties as part of its Africa Partnership Program.

Table 4.9 Iron policy chronology in Malawi

Date	External and internal events, influence, and triggers	Domestic context and policy events
1939/1940	First longitudinal food and nutrition study	Awareness of nutrition as a problem; symptoms of nutritional disorders identified but not of any specific micronutrients
1968–1970	Ad hoc nutrition surveys in Chiradzulu, Lower Shire, and Nkhotakota	High prevalence of malnutrition (Burgers and Wheeler 1970; Driessen and Burgers 1970)
1986	First Nutrition Symposium of Principal Secretaries organized by Center for Social Research and government of Malawi, supported by UNICEF	Recognition of nutrition as a multisectoral challenge (MoH 1986); establishment of Food Security and Nutrition Unit in Ministry of Economic Planning and Development
1988		First edition of food standards by the Malawi Bureau of Standards
1992	Malawi participates in first International Conference on Nutrition (ICN1)	Assigned responsibility for the development of National Plan of Action for Nutrition; elevation of IDD was recognized as part of the plan
Circa 1996	Micronutrient deficiencies become regular part of discussions between donors and MoH	First Micronutrient Committee formed
1990–1995	USAID/UNICEF work with MoH to develop strategies for iron supplementation	Donor support for iron supplementation
2001	Serious drought in Malawi; Save the Children conducts localized nutrition surveys, which show high micronutrient deficiencies	On a visit to Swaziland, President Bakili Muluzi announces food crisis; first National Micronutrient Survey conducted and results published, showing high levels of IDA

Table 4.9 Continued

Date	External and internal events, influence, and triggers	Domestic context and policy events
2004	Office of the President and the Cabinet (OPC)	August: OPC DNHA established
2004/2005	Food and Nutrition Security Policy	Recommends food and nutrition security council in OPC
2005	DNHA/OPC	Introduction of biannual Child Health Days (iron supplements distributed)
2006	GoM/DNHA/OPC	Malawi Growth and Development Strategy
2006	DNHA/OPC	Promotion of optimal feeding practices of children 6–24 months
2007	DNHA/OPC	National food security and nutrition policy and strategic plan finalized (includes HIV/AIDS)
2008	MoH/NSO/DNHA	Second National Micronutrient Survey
2008	DNHA/MoH	Fortification Rapid Assessment Tool
2008	NSO/DNHA	2,000 households interviewed for Demographic Health Surveys
2009	NSO	Multiple Indicators Cluster Survey
2010	Donors initiate SUN	Malawi signs up to SUN
2010	DNHA/MoH	Launch of National Nutrition Policy and Strategic Plan (NNPSP)
2011	MBS	Standards set for iron at all levels in wheat flour, maize meal, and other foods
2013	NNPSP expired	National Nutrition Policy 2013–2018 drafted
2015	Draft National Micronutrient Strategy 2016–2020	Iron deficiency and anemia recognized as a continuing public health concern; gazette on iron standards for fortified foods

Source: Authors' compilation.

Notes: UNICEF: The United Nations Children's Fund; ICN: International Conference on Nutrition; MoH: Ministry of Health; USAID: United States Agency for International Development; OPC: Office of the President and the Cabinet; DNHA: Department of Nutrition, HIV, and AIDS; GoM: Government of Malawi; NSO: National Statistical Office; SUN: Scaling Up Nutrition; MBS: Malawi Bureau of Standards; NNPSP: National Nutrition Policy and Strategic Plan.

Stakeholder Mapping of IDA Policy Institutions

Three different pathways, their corresponding institutions, and their linkages are identified in Table 4.10, which shows the stakeholder mapping of IDA interventions in Malawi. The supplementation pathway and the institutional linkage are similar to the pathways described for vitamin A (see Table 4.6). In implementing supplementation, MoH works with commissioners at the district level. The district health officers have been involved in mobilization activities for Child Health Days in collaboration with local NGOs and, more recently, with SUN initiatives. The pathway for industrial fortification of processed foods with iron also follows a similar pathway to that of sugar fortification. MoH collaborates with MoIT and MBS to develop fortification standards for processed foods. MBS, MoIT, and MoH collectively pursue the monitoring of standards, working with importers, retailers, and food processors. Development partners have supported iron supplementation programs since the early 1990s. However, the fortification of processed foods other than sugar has not received support from donors or development partners. MoAIWD, through DARS, takes the lead in biofortification. DARS works with the Agricultural Development Districts and district commissioners to reach farmers with the newly developed iron-rich crops. The Ministry of Education has also been involved in the School Health and Nutrition (SHN) program to reach adolescent girls through supplementation. However, this program was discontinued as it was funded through a World Bank project.

Table 4.10 Iron stakeholder inventory in Malawi

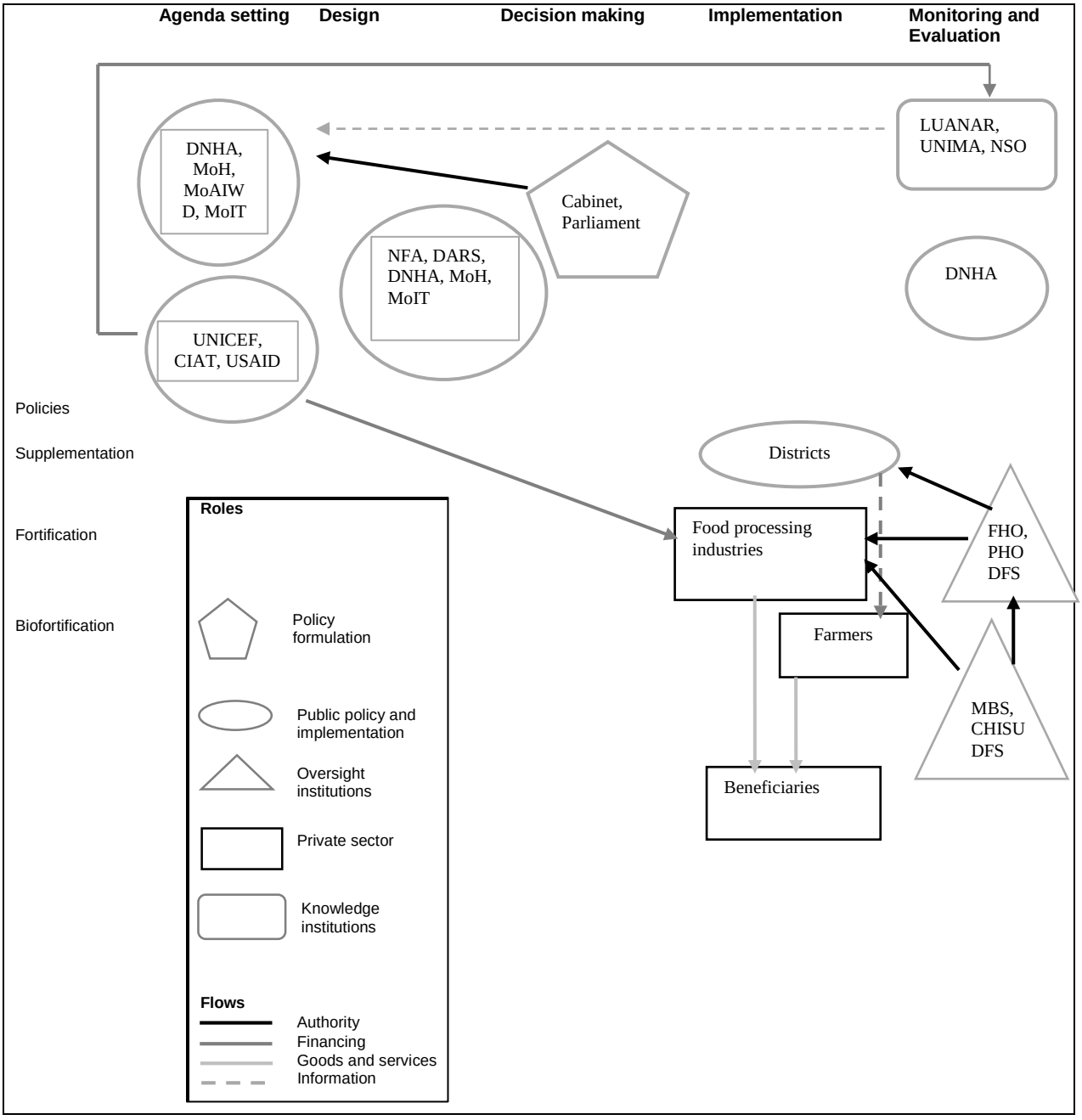
Institution	Category	Role	Resources	Influence	Policy stance
MoH	Government	• Issues regulations • Enforcement • Education • Manages public health campaigns	• Limited	• Large	Champions all forms of iron fortification, supplementation, and biofortification
District Health Officer (DHO)	Government	• Implements public health programs and Child Health Days	• Limited	• Large	• IDA intervention and promotion
DNHA	Government	• Identifies key issues and policy options • Monitors implementation	• Limited	• Large	• Champions all forms of iron fortification, supplementation, and biofortification
NFA	Government	• Identifies fortification opportunities • Monitors program implementation • Policy change dialogue	• Mostly donor supplied; participants bear the cost of participation	• Large	• Champions fortification and micronutrient policies
MBS	Government	• Sets standards and testing protocols for fortification	• Limited	• Large	• Neutral
CHISU	Government	• Tests samples from the inspection system	• Limited	• Limited	• Neutral
MoIT	Government	• Enforces inspection of fortified products	• Limited	• Large	• Neutral
MoAIWD	Government	• Crop breeding for biofortification • Promoter of iron-rich foods through diet diversification	• Limited	• Large	• Champions biofortification
Parliament	Legislatures and acts	• Passes legislation • Monitors budget allocation	• Limited	• Limited to approval of the budget	• Questions competitiveness of sugar market
Food processing industries	Private sector	• Fortification of processed foods	• Large	• Large	• Hesitant to undertake full implementation
UNICEF	Donor	• Funds studies • Funds testing • Funds education • Technical assistance	• Large	• Large	• Champions all forms of MDD interventions: supplementation, fortification, and biofortification
USAID	Donor	• Funds studies • Funds testing • Funds education • Technical assistance	• Large	• Large	• Champions all forms of MDD interventions: supplementation, fortification, and biofortification
LUANAR	Researchers	• Empirical research on IDA	• Limited	• Limited	• Research-based participation in IDA discussion

Source: Authors' compilation.

Notes: MoH: Ministry of Health; DHO: District Health Officer; DHNA: NFA: National Fortification Alliance; MBS: Malawi Bureau of Standards; CHISU: Central Health Information Services Unit; MoIT: Ministry of Industry and Trade; MoAIWD: Ministry of Agriculture, Irrigation, and Water Development; UNICEF: The United Nations Children's Fund; USAID: United States Agency for International Development; LUANAR: Lilongwe University of Agriculture and Natural Resources.

Building on the stakeholder inventory, Figure 4.6 shows the stakeholder mapping of the IDA interventions in Malawi.

Figure 4.6 Institutional mapping of Malawi's iron policy process



Source: Authors.

Notes: DNHA: Department of Nutrition, HIV, and AIDS; MoH: Ministry of Health; MoAIWD: Ministry of Agriculture, Irrigation, and Water Development; MoIT: Ministry of Industry and Trade; UNICEF: The United Nations Children's Fund; CIAT: International Center for Tropical Agriculture; USAID: United States Agency for International Development; NFA: National Fortification Alliance; DARS: Department of Agricultural Research Services; DNHA: Department of Nutrition, HIV, and AIDS; LUNAR: Lilongwe University of Agriculture and Natural Resources; UNIMA: University of Malawi; NSO: National Statistical Office; FHO: Food Hygiene Officer; PHO: Port Health Officer; MBS: Malawi Bureau of Standards; CHISU: Central Health Information Services Unit.

Iron Supplementation

Iron supplementation started in the mid-1990s after the global initiatives. Supplementation for pregnant women during their antenatal visit and adolescent girls through school was implemented with the support of donors. The results of the first National Micronutrient Survey in 2001 showed high levels of IDA, leading to a renewed effort to increase the coverage of iron supplementation. In 2005, with the introduction of Child Health Days, the coverage of iron supplementation was ramped up. However, even now, the coverage remains grossly inadequate, and compliance of the regimen is also poor (Appendix Table A.3).

Fortification of Processed Food with Iron

Fortification of processed foods with iron and other micronutrients entered policy discussions after the first National Micronutrient Survey. In 2004, when DNHA moved to OPC, there was a push toward increasing fortification of all processed foods with micronutrients. The negotiation with the food processing industry continued throughout the 2000s. The fortification of processed foods was gazetted in 2015.

Biofortification of Beans for Iron

The urgency toward looking at a longer, sustainable solution to IDA in Malawi comes from two primary drivers. First, the supplementation program for iron and folic acid has not been successful in reaching vulnerable populations. Furthermore, those reached have not been highly compliant with the recommended intake of iron supplementation. Second, the funding for IDA interventions chronically depends on donor funding. Results of the first comprehensive National Micronutrient Survey show that all sections of the population are affected by IDA, with prevalence among preschool children (80 percent), women of childbearing age (27 percent), and men (17 percent) (NMS 2004).

The Malawi Micronutrient Strategy 2013–2018, identified biofortification of crops for micronutrients as one strategy for addressing IDA. In addition, several studies outside Malawi support use of biofortified crops for addressing IDA. Beans are a major food crop in Malawi that have been identified for iron fortification. This section describes the current process for improving the iron content of beans grown in Malawi, thereby increasing iron consumption among the farming population.

For the past five years, CIAT has been collaborating with DARS in MoAIWD to develop better bean varieties. In the mid-2000s, DARS and CIAT collaborated to work on iron-fortified beans. CIAT, as part of its Pan-African Bean Research Alliance (PABRA) Focus Research Area focused on bean biofortification in Malawi. Initial concerns with the development of biofortified beans in Malawi included identifying how much breeding would improve the iron content in beans, the bioavailability of iron at various levels of human consumption, and the adoption of biofortified varieties by farmers. PABRA's goal was to increase the iron content of beans threefold. The target of increasing iron content in beans was set at 44 mg/g—that is, an increase from 50 mg/g to 94 mg/g. In addition to iron fortification, the breeding network also considered zinc fortification. The target for zinc was 17 mg/g, increasing the level of zinc content from 30 mg/g to 47 mg/g.

At the Chitedze Agricultural Research Station, DARS collaborated with CIAT scientists to screen bean varieties that contained high levels of iron. The team selected two promising varieties—NUA 45 and NUA 59—which were released in 2009. The current effort involves multiplying basic seeds for producing adequate quantities of certified seeds to be distributed to farmers. DARS is working with partners in the NGO community and with selected seed companies to develop certified seeds. The seed system has been under a slow reform process in Malawi, increasing the challenges in iron biofortification of beans.

The biofortification strategy recommends 200 g of bean consumption per day for women, 100 g for children 4–6 years of age, and 50 g for children 1–3 years of age (Zulu 2014). Several issues remain to be addressed by the research community—namely, the loss in iron content of beans during the cooking process, the average consumption of beans in a rural Malawian diet, and a reduction in the antinutritional

factors of beans that inhibit the availability of iron and zinc for human absorption. Further efforts are needed to develop new food recipes with beans and to incorporate beans in food consumption patterns in areas where they are not currently consumed (either as a vegetable or as a processed food) in Malawi. Value chain development to promote iron-rich bean varieties is still at an early stage in Malawi. There is a need for greater involvement of nutritionists in the extension process in order to educate farmers about iron-rich bean varieties. This will require coordinating the efforts of public extension systems, the private sector, and NGOs such as Catholic Relief Services to multiply and distribute certified seeds from foundation seeds. Increased involvement of the private sector in the development of processed foods with iron-rich bean varieties can also help increase the iron content of processed foods (Zulu 2014). Table 4.11 presents the evolving iron mandate in Malawi.

Table 4.11 Evolving iron mandate in Malawi

Key years	1988	1999	2014/2015
Statutory instruments	First edition of food standards	Several foods for fortification mentioned but no specific standards set for iron	Iron fortification of processed foods gazetted in April 2015, including wheat flour, corn-soya blend, and maize meal
Requirement	None mentioned	Not mandatory	Mandatory
Point of inspection	Not inspected	Not inspected	Import (port of entry) Point of production, wholesale market, and retail market Household (survey)
Fortification level (iron levels)	Not specified	Not specified	Iron standard for maize = 27–51 mg/kg at all levels; for wheat = 21–41 mg/kg at all levels
Enforcement agency	MoH	• MoH/CHISU • MoIT • DNHA • MBS • NFA	• MoH/CHISU • MoIT • DNHA • MBS • NFA: quarterly monitoring at district level and post entry NFA in 2015
Enforcement level and challenges	Not enforced	Not enforced	Moderate; equipment and resources not adequate; NFA reviews the results from monitoring

Source: Authors' compilation.
Notes: MoH: Ministry of Health; CHISU: Central Health Information Services Unit; MoIT: Ministry of Industry and Trade; DNHA: Department of Nutrition, HIV, and AIDS; MBS: Malawi Bureau of Standards; NFA: National Fortification Alliance.

Hypothesis Testing

The stakeholder inventory for iron-related policy and programs in Malawi is given in Table 4.10. This provides the basis for hypothesis testing the kaleidoscope model applied to IDA interventions in Malawi.

Agenda Setting

The main events that triggered iron supplementation interventions in Malawi were global conferences, such as the UNICEF World Summit for Children in 1990 and ICN1 in 1992. These conferences not only raised awareness about micronutrient deficiencies but also set international goals for eliminating IDAs. They helped receive donor support in Malawi as part of translating the global goals into national strategies. Donors also helped design programs, plan interventions, and fund the import of supplements in Malawi. The first National Micronutrient Survey was used to track the progress made in reducing IDA. The first survey in 2001 showed a high level of IDA in Malawi. This finding provided policy makers and donors with evidence to argue for continued and increased coverage of iron supplementation programs.

Design

The design of the IDA interventions in Malawi followed already successful international experiences. Given that the diets of Malawians are highly dependent on maize and that the capacity to fortify processed food was limited, policy makers sought to begin with iron supplementation programs. The design of the fortification programs has been adapted from successful food fortification initiatives in other countries. The iron-rich bean biofortification approach is a result of regional cooperation of a network supported by CIAT.

Adoption

The adoption of the iron supplementation program was supported by a group of proponents from the donor community, MoH, and research studies that were conducted both in and outside the country. Iron supplementation in Malawi did not have any opponents, as it was primarily funded by donors. In the long run, such dependence can have an influence on adoption of one method over another. In the case of iron supplementation, fortification of processed food was thought to be more effective and sustainable once legislation was enacted. However, food processors have expressed concerns about their inexperience and the need for technical assistance and establishment of fortification facilities, as occurred with sugar and vitamin A fortification. Enthusiastic support from local leadership, financial support from donors (UNICEF and USAID), and the technical support of CGIAR has majorly contributed to the adoption of IDA interventions in Malawi.

Implementation

The implementation of iron supplementation continues to depend on support from the donor community. The SUN initiative has helped provide better coverage in project areas. However, poor compliance by pregnant women with the recommended regimen remains a challenge. The CSONA network of NGOs has been helpful in tracking the expenditures of nutrition-related interventions. Above all, the continued commitment of policy makers who have been championing the cause of micronutrients has resulted in the implementation of supplements and has pushed for legislation regarding the fortification of processed foods. Even with legislation, however, the capacity to monitor the standards of various fortified foods remains a challenge, as the testing labs require continuous support from donors for their effective functioning.

Evaluation and Reform

Challenges related to implementation and the high level of IDA shown by the second National Micronutrient Survey results have increased the resolve of policy makers and donors to continue to keep IDA at the top of the nutrition policy agenda, as reflected by the revised Nutrition Policy and the Micronutrient Strategy document. Based on the discussion and the responses of the interviewees, Table 4.12 presents the summary of the iron kaleidoscope model hypothesis testing.

Table 4.12 Iron policy hypothesis testing

Policy stages	**Supplementation**		**Fortification**	**Biofortification**
Kaleidoscope hypotheses	**Pregnant women and children under5**	**Adolescent girls**		
1. Agenda setting				
1.1. Powerful advocates	++	++	++	+
1.2. Focusing event	++		++	+
1.3. Recognized, relevant problem	++	++	++	+
2. Design				
2.1. Pressing versus chosen problem				
2.2. Ideas and beliefs			-	
2.3. Cost-benefit calculations	-	-	+	+
2.4. International design spillovers	+	+	+	+
3. Adoption				

3.1. Propitious timing				+
3.2. Veto players	+	+		+
3.3. Relative power: proponents versus opponents			++	

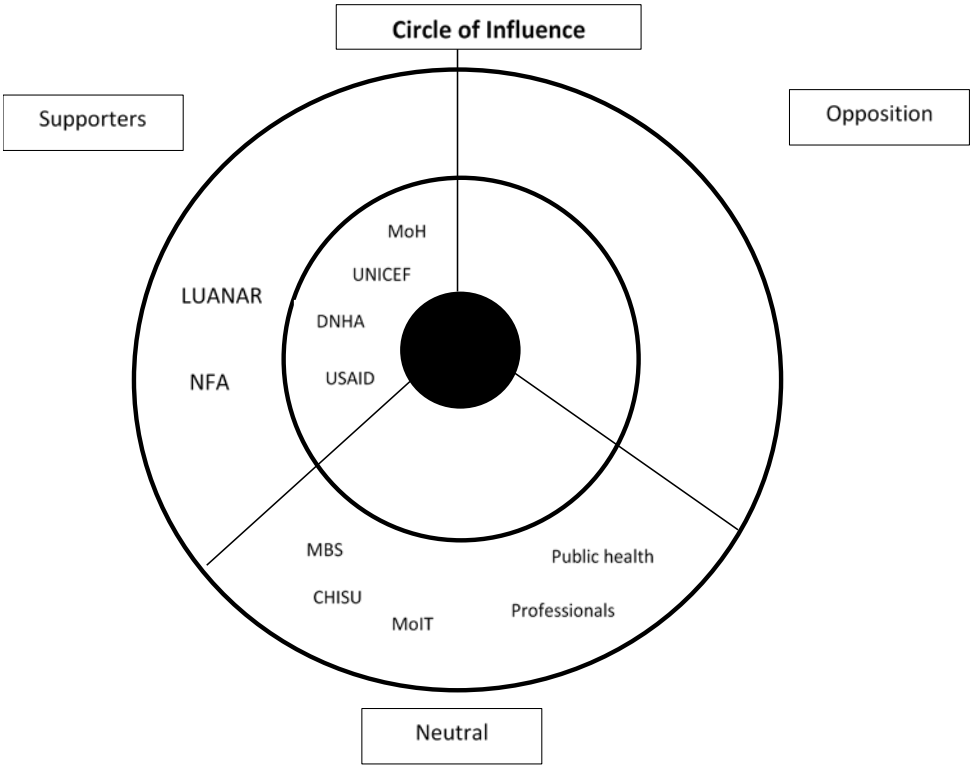
Table 4.12 Continued

Policy stages	Supplementation		Fortification	Biofortification
Kaleidoscope hypotheses	**Pregnant women and children under5**	**Adolescent girls**		
4. Implementation				
4.1. Institutional capacity	-		-	+
4.2. Requisite budgetary allocations	-			
4.3. Commitment of policy champion				
	+			+
			++	
5. Evaluation, Reform				
5.1. Changing conditions				
5.2. Changing information or beliefs	-	-		
5.3. Resources available relative to cost	+	+	+	-

Source: See Appendix Table F.3 for details.
Notes: + = significant positive impact of this variable on policy outcomes; - = significant negative impact of this variable on policy outcomes.

The circle of influence for iron fortification is given in Figure 4.7.

Figure 4.7 Iron fortification circle of influence in Malawi



Source: Authors' field interviews
Notes: LUANAR: Lilongwe University of Agriculture and Natural Resources; NFA: National Fortification Alliance; MoH: Ministry of Health; UNICEF: The United Nations Children's Fund; DNHA: Department of Nutrition, HIV, and AIDS; USAID: United States Agency for International Development; MBS: Malawi Bureau of Standards; CHISU: Central Health Information Services Unit; MoIT: Ministry of Industry and Trade.

5. CONCLUSIONS

This paper looked at the micronutrient policy processes in Malawi to understand the drivers of policy change. The authors applied the kaleidoscope model to test key hypotheses on specific drivers and their influence on policy change during various stages of the policy process. This section summarizes the results of the study.

Summing Up Key Hypotheses on Drivers of Micronutrient Policy Change

Nutrition as a development theme has been on the policy agenda of the government of Malawi ever since the mid-1980s, when the country's nutrition maps were developed. However, specific micronutrient challenges and the approach to addressing them have been subject to varying levels of success at the final adoption and implementation stage.

Agenda Setting

External events in the early 1990s played a major role in elevating micronutrient challenges to the top of Malawi's nutrition policy agenda. These events helped develop a strong coalition between national partners and the donor community to address the key micronutrient challenges, such as IDD, VAD, and IDA. While local surveys had initially identified MDD as serious health concerns, global goal setting became the principal events for addressing MDD at the national level. Fortification of processed food was seen as a medium-term, yet cost-effective, solution, at least in the case of sugar for vitamin A. This process helped pave the way for pushing total fortification of all processed foods as a possible strategy. Biofortification was brought in by the global agricultural research system through regional crop-based networks. Since the early 2000s, local leadership has been responsible for and has contributed effectively to keeping MDD on the policy agenda, as reflected in the revised Nutrition Policy and the National Micronutrient Strategy (NMS 2013).

Design

The design of the iodization of salt program was borrowed from approaches that had proven successful in other countries in the early 1990s. Similarly, the cost effectiveness of vitamin A and iron supplementation programs in other developing countries was used to design supplementation programs for Malawi. The design of fortification of sugar came directly from successes in Guatemala and Zambia. The biofortification approaches to iron-rich beans and vitamin A–rich OFSPs were collectively adopted through the regional crop development networks with the help of CGIAR centers. All the interventions were adjusted to adapt to local conditions and needs.

Adoption

While the adoption of salt iodization and the supplementation of vitamin A and iron were quick and without any opposition, the adoption of fortification of sugar for vitamin A was met with resistance from the sugar company, which resulted in a delay in the adoption of fortified sugar. It took nearly 20 years for sugar fortification to become a legislation. In this case, even with the president's veto power, the donors and the government had to allay the fears of the sugar company by investing in studies, study tours, equipment, and fortificants. In the case of biofortified crops, the adoption was smooth, with swift implementation of OFSP, for example, which helped in developing the strategy and nutrition action plan for this approach. Finally, the adoption of fortification of all processed food was facilitated by the adoption of sugar fortification and the continuous advocacy of the country's nutrition leadership.

Implementation

Implementation of salt iodization and supplementation of VAD and IDA continues to suffer from dependency on donor support. Further, monitoring of salt and salt testing require laboratory supplies and equipment that are supplied by donors; the cost of supplements is also fully borne by donors. Thus, the sustainability of these interventions depends on continued donor assistance. Furthermore, institutional capacity to implement the supplementation program remains a major challenge. Biofortification programs have built effective partnerships and the local capacity for multiplication and dissemination of the technology. As was the case in Zambia (Haggblade et al. 2015), the commitment of local champions and donor support in Malawi have helped compensate for resource and implementation capacity constraints. As the country invests more in fortification standards and biofortification, the private sector's role becomes crucial for implementation. However, the government also needs to play its role in setting standards, revising them according to emerging situations, developing a system that will facilitate the speedy release of biofortified crop varieties, and monitoring the compliance and progress of its efforts.

Evaluation and Reform

National micronutrient surveys and other household surveys provide information on the effects of the policies and programs designed for improving the micronutrient status of the Malawian population. Results from the first survey were effective in increasing the emphasis on micronutrient policies and program interventions. Current discussions on micronutrient fortification levels and standards in Malawi are beginning to focus on revising the standards to be in line with international and regional standards. The planned food and nutrition act and continued research on the consumption of micronutrients will help shape this debate in the near future. The key variables are summarized in Table 5.1. We find that, depending on the nature of the policy and the need for testing specific hypotheses of the policy process, the kaleidoscope model shows a high level of applicability. As illustrated by the case studies and the specific hypotheses developed, the model is an effective tool for the study of policy processes in policy settings in developing countries.

Common Factors Influencing the Effectiveness of Micronutrient Advocates

As in Zambia, several factors contribute to the effectiveness of micronutrient advocates in the policy process. In all the approaches to MDD studies, the common factors that drive the effectiveness of the policy and program advocates include the policy environment, local leadership, information, resources, and the nature of opposition. The Malawi case study shows that when local policy environment is conducive to change, it is easy for a policy or program to get designed and adopted. For example, in the mid-1980s, the information on malnutrition began to reach policy makers, who believed malnutrition was not a problem in Malawi. The first meeting of the principle secretaries challenged this view, and the policy stance became favorable to nutrition advocates. A Food and Nutrition Unit was established in the Ministry of Economic Planning and Development that reported directly to the president. This prepared the ground for easy acceptance of the global goals set for the elimination of MDD in the early 1990s. Similarly, a favorable policy environment existed in the early 2000s, when fortification of sugar was proposed. However, the experience with sugar fortification showed that the policy environment alone is not sufficient, even with the president's veto power.

The local leadership of the nutrition community and the donor community in keeping micronutrient challenges on the policy agenda is key for the improvements made in the fight against MDD. Global and local information on the causes and consequences of MDD was useful to policy advocates as evidence in debates and discussed during the policy process. The international best practices and the costs of implementing similar programs in other countries helped shape the design of micronutrient interventions in Malawi. The programs were easily adopted without much opposition when they were backed up with donor resources. However, this system may not be sustainable in the long run. This recognition by policy makers helped move the solutions from supplementation, which primarily

depends on donor funding, to fortification of processed food, in which the cost and responsibility for implementation could be effectively transferred to the private sector and consumers. Further, it helped move toward the biofortification of crops as a long-term sustainable solution. The fortification of processed foods as an approach to solve MDD continues to face challenges and will involve initial hand holding and support to the food processing industry. However, the recent legislation on the fortification of processed food gives the government an opportunity to effectively engage in the discussion with the private sector and work with them as key partners to combat MDD.

Lessons from the Hypothesis Testing of the Kaleidoscope Model

The Malawi case study presented here helps understand the applicability of the kaleidoscope model of policy process. We summarize the applicability of the model in Tables 5.1 and 5.2.

Table 5.1 presents a summary of the policy system constraints related to implementation challenges. It also identifies opportunities for amendments for further improvement in the micronutrient policy process. The policy constraints are identified in the policy system, health/nutrition policy, and specific micronutrient levels. Table 5.1 also summarizes the links between the policy process and policy outcomes. It broadly shows that the kaleidoscope model can be effectively used to study the links between process factors and outcome factors. As shown earlier, specific characteristics of the policy process could be identified at different stages of the process and connected to the outcomes for each micronutrient studied. This further helps in policy tracking, given the dynamic nature of policy making and learning to improve the process itself.

The applicability of the policy process tools as expounded by the kaleidoscope model in the context of micronutrient policies in Malawi is quite high. The kaleidoscope model is broadly applicable for studying the policy processes, as shown by the three sets of policies studied in this paper. It is more applicable in specific contexts than in others. For example, in the case of highly debated and contested policy designs, it can help understand the nature and power of proponents and opponents in specific stages of the policy process. In other stages, it can be used for descriptive purposes rather than for analysis.

Finally, the applicability of operational hypotheses of the kaleidoscope model to micronutrient policies in Malawi is given in Table 5.2. Once again, depending on the nature of the policy and the need for testing specific hypotheses of the policy process, the kaleidoscope model shows a high level of applicability. As illustrated by the case studies and the specific hypotheses developed, the model is an effective tool for the study of policy processes in policy settings in developing countries.

Table 5.1 Analysis of policy system constraints as they relate to implementation challenges

Micronutrient	Current approach to implementation	Policy system constraints	Relates to broad health/nutrition policy making	Specific to micronutrient policy making	Amenable to reform?
Iodine	Fortification	National system interaction with regional/global organizations for standards/specifications Monitoring/tracking results Policy agenda setting, design, and adoption are not a challenge, but implementation, and monitoring remain a challenge due to resource constraints and practical challenges on the borders.	Placement of nutrition in OPC for all nutrition policies; tracked as part of larger nutrition surveys Micronutrient deficiencies are recognized and addressed as part of the broader nutrition policy development.	Iodized salt testing for specifications Investment in infrastructure for monitoring Specifically monitored through micronutrient surveys; results are taken into consideration on the policy making toward micronutrient deficiencies.	Yes, but needs sustained funding for monitoring and tracking Steps have been taken to equate the standards to meet ECSA specifications.
Iron	Supplementation	Well accepted in the policy system Iron supplementation implemented as part of primary health care for pregnant women	Iron deficiency and resultant anemia form a regular part of policy development and discussions. Continuous dependence of external aid.	Monitoring the use of supplementation/tracking coverage	Yes, better linking the delivery, use, and prevalence of monitoring needed
	Biofortification	Agriculture–nutrition policy linkages not well defined in Ministry of Agriculture No policy constraint in development of iron-fortified varieties	Better linkage of nutrition extension and biofortification research	Support needed for multiplication and distribution of seeds	Yes, need to be part of evolving National Action Plans
Vitamin A	Supplementation	Similar to iron Operated through well-accepted policy/program	Research and monitoring use remain a challenge. Funding is external.	National budget allocation monitored by SUN movement	Yes, continued monitoring, feedback to policy debate needed
	Fortification	Fortification of major processed food accepted in policy	Sugar fortification mandatory Support to industry identification	Monitoring by government and UNICEF	Yes, discussions in NFA meeting
	Biofortification	Part of national research system activities	Research funding depends on external aid	Processing at central level to increase acceptability by consumer in at early stage	Yes, better integration of research policy with national micronutrient strategy

Source: Authors' compilation.
Notes: ECSA: East and Central Africa; UNICEF: The United Nations Children's Fund; NFA: National Fortification Alliance.

Table 5.2 Role of determinants of the kaleidoscope model in the micronutrient policy process in Malawi

Applicability of operational hypothesis of K-Model to micronutrient policy in Malawi						
Hypothesis	**Iodine fortification**	**Iron supplementation**	**Iron biofortification**	**Vitamin A supplementation**	**Vitamin A fortification**	**Vitamin A biofortification**
1. Agenda setting						
1.1. Focusing events	****	****	***	****	****	***
1.2. Powerful advocacy coalitions	****	****	***	****	*****	***
1.3. Recognized, relevant policy problem:	****	****	****	****	*****	****
2. Design						
2.1. Pressing versus chosen problems	****	****	***	****	*****	***
2.2. Ideas and beliefs	****	****	***	****	*****	***
2.3. Cost-benefit calculations	***	****	***	****	*****	***
2.4. Design spillovers	****	****	*****	*****	*****	
3. Adoption						
3.1. Propitious timing	***	***	**	****	***	**
3.2. Veto players	***	*	**	*	*****	**
3.3. Relative power of proponents versus opponents	**	*				
4. Implementation						
4.1. Institutional capacity	****	****	****	****	*****	****
4.2. Requisite budgetary allocations	****	****	***	****	*****	***
4.3. Commitment of policy champions	****	****	***	****	*****	***
5. Evaluation and reform						
5.1. Changing conditions	****	****	***	****	*****	***
5.2. Changing information or beliefs of veto players and champions	****	****	***	****	*****	***
5.3. Available resources relative to cost	****	****	***	****	*****	***

Source: Authors' compilation.

Notes: ***** highly applicable; **** applicable; *** not clear; ** less applicable; * least applicable

Concluding Remarks

In this paper, we tested the kaleidoscope model of policy process in the context of micronutrient policies in Malawi. Table 5.3 presents the links between the policy process and policy outcomes for each of micronutrient studied. Using historical reviews of the literature and key informant interviews, we were able to assemble information that is used to study the applicability of the model in nutrition policy making. Results broadly show the utility of the model in its application to the nutrition policy context in Malawi. Other case studies concurrently implemented in Zambia and South Africa will further help in the understanding and application of the model.

Table 5.3 Linkages between policy process and policy outcomes

Specific characteristics of policy process (broad contextual factors)	Linkages to program and policy outcomes		
	Iodine	**Iron**	**Vitamin A**
Agenda setting			
Nutritional issues come up from external advocacy (UNICEF); local institutions collaborate (CRS, Zomba) with external institutions and donors.	External players and focusing events Local recognition of a long-standing health concern by resources/policy makers	Global summits/conferences and internal players (MoH) accepting challenges helps bring it to policy agenda.	Global summits/conferences and internal players join to set agenda (MoH/UNICEF); fortification agenda remains in discussion for 10 years.
Design			
Government goes from “no malnutrition” to accepting nutrition in Economic Planning and Development; Malawi nutrition maps help in technical discussion; National Micronutrient Surveys further help with continued design of new approaches.	Globally accepted norm available; salt accepted as medium, mostly imported; policy becomes easy to design.	Designed with help of UNICEF; supplementation followed international norms; biofortification design through participation of researchers in bean network.	Design for supplementation follows global norms for fortification. Supplementation design based on universal norms; sugar as a medium for fortification comes through experiences in other countries; biofortification in maize comes through external collaboration.
Adoption			
Single party to multiparty helped move adoption faster; presence of nutrition in MEPD/OPC made a better enabling environment for adoption.	Coordination of MoH, MBS, and MoIT major challenges but resolved quickly	Supplementation adopted quickly as single ministry approved	Fortification of sugar took nearly 20 years for adoption after first discussion; supplementation and biofortification adopted without any resistance; partially external funded
Implementation			
District-level capacity to implement and interministerial structures established (NFA)	Implementation depends mainly on enforcing standards, testing, monitoring policy toward sustainable action	Child Health Day distribution and targeting children and pregnant and lactating mothers; other groups left out	External and internal pressure for sugar industry to comply
Evaluation and Reforms			
Presence of DONUTS; NFA and SUN support of CSONA for tracking nutrition expenditures; Demographic Health Surveys help in periodic monitoring of policy outcomes	Reconsideration of specifications to be in line with ECCSA standards; continued surveillance recognition	Ammonia still a challenge in specific group. Biofortification requires seed distribution systems; central processing of maize meal needed for orange maize. Cultivation processing and distribution	Fortification of major processed food makes vitamin A available through more pathways. Evaluation of vitamin A after 2013 full-scale fortification not done.

Source: Authors based on field interviews

Notes: UNICEF: The United Nations CRS: Catholic Relief Service; Children's Fund; MoH: Ministry of Health; MEPD: Ministry of Economic Planning and Development OPC: Office of the President; MBS: Malawi Bureau of Standards; MoIT: Ministry of Industry and Trade; ECCSA: East, Central and Southern Africa Health Community; DONUTS: Donors Nutrition Network; CSONA: Civil Society Organisation Nutrition Alliance.

APPENDIX A: SUPPLEMENTARY BOXES AND TABLES

Box A.1 Key micronutrient policy institutions in Malawi

Office of the President and Cabinet (OPC): OPC is responsible for overall governance of the country. It provides leadership for the sectoral ministries and the cabinet. Nutrition as a multisectoral issue was under the direct supervision of OPC. The Department of Nutrition, HIV, and AIDS (DNHA) was housed in OPC from 2005 to 2014.

Ministry of Health (MoH): MoH is responsible for designing and implementing health-sector policies and programs, including nutrition policies and programs. It seeks to achieve the goal of "Health for All" Malawians. It provides service functions that include provision of primary and secondary (referral) health-care services and provision of health information to the public. It focuses on quality of health care, particularly for mothers and children under 5 years of age; integrated health services; efficiency and equity of resource allocation; increasing access to health care; quality of human resources; and collaboration and partnership in health care. The Department of Nutrition is part of its clinical services directorate and is run by a deputy director. Since 2014, as part of the public-sector reforms, DNHA has been located in the MoH with its own director (www.malawi.gov.mw/index.php?option=com_content&view=article&id=50&Itemid=22).

Ministry of Gender, Children, Disability, and Social Welfare: This ministry is responsible for promoting social and economic empowerment and protection of women and children. It is also entrusted with ensuring gender equality and protecting the welfare of Malawian women, men, girls, and boys to become self-reliant, active participants and beneficiaries of the national development agenda. The ministry's nutritional commitment is ensured through its Department of Child Development, which is mandated to provide care, support, and protection to children through integrated early childhood development.

Central Health Information Services Unit (CHISU): CHISU houses the laboratories that test the contamination levels and nutrient content of food. The iodine content of salt and the vitamin A and iron content of processed foods are tested in the laboratory. CHISU is a member of the National Fortification Alliance (NFA) and is responsible for producing regular reports to the NFA for its monitoring activities.

Department of Nutrition, HIV, and AIDS (DNHA): Established to address the dual burden of poor nutrition and HIV/AIDS, the department is responsible for addressing the nutritional concerns of the population and for addressing HIV/AIDS as a national health priority for the government. DNHA is responsible for coordinating nutrition programs and policies; it reports to the Minister of Health.

Lilongwe University of Agriculture and Natural Resources (LUANAR): Previously known as Bunda College of Agriculture, the university now has other constituent colleges, such as Natural Resources College and Forestry College. LUANAR started to teach nutrition courses as part of the diploma and bachelor of science degree in agriculture in 1974. It produces human resources that have contributed to nutrition problem solving in Malawi. It also conducts research on nutritional issues through clinical studies, such as socioeconomic and anthropometry surveys. It participates regularly in the nutrition policy discussions of the government of Malawi.

Centre for Social Research (CSR): CSR is a think tank and part of Chancellor College, Zomba. In the 1980s, it played a key role in bringing nutrition to the top of the development agenda. Its collaboration with UNICEF to organize the 1986 Nutrition Symposium for Principal Secretaries paved the way for the establishment of the Food Security and Nutrition Unit in the Economic Planning and Development Department of the OPC. CSR continues to play a key role in providing research-based evidence for the nutrition policy-making process.

Malawi Bureau of Standards (MBS): Located in Blantyre, the MBS is a statutory organization established in 1972 by an act of Parliament (Chapter 51:02, as amended). MBS is responsible for the formulation and dissemination of standards and provides testing services for product certification.

Source: Authors.

Box A.2 Key legislation and regulations shaping micronutrient policies in Malawi

Key Regulations

Legal Foundation Document

• Malawi Constitution under Chapters III and IV provides for the Principles of National Policy and Human Rights, respectively (GoM 2013). In section 13 (b), the Constitution provides that: "The State shall actively promote the welfare and development of the people of Malawi by progressively adopting and implementing policies and legislation aimed at achieving the following goals: (b) Nutrition – To achieve adequate nutrition for all in order to promote good health and self-sufficiency" (GoM 2016).

Nutrition Policy Formulation

• Malawi Growth and Development Strategy (MGDS): The MGDS II, as the overarching policy document, identifies nutrition as subtheme 6 as one of the priorities under "Social Development." The policy shall thrive to uphold the goal "to have a well-nourished population that effectively contributes to the development of the country" (GoM 2016). The Malawi National Food and Nutrition Act is currently under formulation and will be finalized soon.

Food Fortification

Catalogue of Standards (2011), Malawi Bureau of Standards

Key Policy Documents

- National Plan of Action for Nutrition 1994
- National Nutrition Policy and Strategic Plan 2007–2012
- National Education and Communication Strategy
- Infant and Young Child Feeding
- Malawi Demographic Health Survey 2010
- Multiple Indicator Cluster Survey
- National cluster indicators survey
- School Health and Nutrition Strategic Plan 2009–2018
- Malawi government (2012): Nutrition Education and Communication Strategy (NECS) 2011–2016
- Malawi government (2010): 2009 National Micronutrient Survey
- Malawi Growth and Development Strategy

Key international Human Rights Instruments Guiding National Nutrition Policy in Malawi (GoM 2013)

- "Malawi Commitments on Nutrition" documented in "Nutrition for Growth: Beating Hunger through Business and Science"—London 2013 meeting on Global Nutrition for Growth
- International Covenant on Economic, Social, and Cultural Rights,
- Convention on the Elimination of All Forms of Discrimination Against Women
- Convention on the Rights of the Child
- African Charter on Human and Peoples Rights and its relevant protocols
- South African Development Community Protocol on Gender and Development
- Declaration of Commitment on HIV and AIDS: "Global Crisis—Global Action"
- Maputo Declaration on Tuberculosis, HIV/AIDS, Malaria and Other Related Infections

Source: Authors' compilation.

Table A.1 Impact of undernutrition interventions on Millennium Development Goals (MDG)

MDG 1: "Eradicate extreme poverty and hunger"	Reducing "prevalence of underweight children under-five years of age" is an agreed target of MDG 1. Reducing undernutrition increases economic growth.
MDG 2: "Achieve universal primary education"	Reducing undernutrition increases cognitive development and contributes to learning and school completion rates.
MDG 3: "Promote gender equality"	Promoting better nutrition practices contributes to empowering women and to reducing discrimination against girls in family feeding practices.
MDG 4: "Reduce child mortality"	Enormous impact of lower undernutrition on child mortality.
MDG 5: "Improve maternal health"	Improved maternal nutrition and reduced maternal mortality through programs of behavior change and iron and folic supplementation.
MDG 6: "Combat HIV and AIDS, malaria and other diseases"	Reduces maternal and child mortality caused by the interaction of undernutrition with HIV/AIDS and other infectious diseases.
MDG 7: "Ensure environment sustainability"	Better nutritional practices mean more effective use of available food and thus better adaptation to environment stress (target 7a), increased health impact from improved access to water and sanitation (target 7C), and improvement in lives of slum dwellers (target 7D).
MDG 8: "Global partnership for development"	Addressing hunger and malnutrition around the world is a key element of and argument for the global partnership for development. This applies particularly to the least-developed countries (target 8B) where levels of undernutrition are highest.

Source: GoM (2013).

Table A.2 Changes in micronutrient status: Vitamin A

Vitamin A **Target group**	**Measuring indicator units**	**Prevalence of micronutrient deficiency levels (%), 2001**	**Prevalence of micronutrient deficiency levels (%), 2009**
Preschool children (3–6 months)	mcg/dL	59.2	22.0
Schoolchildren (2–12 years)	mcg/dL	38.3	8.5
Childbearing women (15–45 years)	mcg/dL	57.4	1.6
Adult men (20–55 years)	mcg/dL	36.9	0.2

Source: Authors' compilation.

Table A.3 Changes in micronutrient status: Iron

Iron Target group	Micronutrient deficiency	Measuring indicator units	Prevalence of micronutrient deficiency levels (%), 2001	Prevalence of micronutrient deficiency levels (%), 2009
Preschool children (3–6 months)	Hemoglobin	g/dL	79.7	54.8
Schoolchildren (2–12 years)	Hemoglobin	g/dL	22.3	25.4
Nonpregnant women (15–45 years)	Hemoglobin	g/dL	27.0	32.0
Pregnant women (15–45 years)	Hemoglobin	g/dL	22.1	13.0
Adult men (20–55 years)	Hemoglobin	g/dL	17.4	12.2
Preschool children (3–6 months)	Iron	(μmol/mol) Using ZP	64.6	10.3
Schoolchildren (2–12 years)	Iron	(μmol/mol) Using ZP	13.9	3.7
Nonpregnant women (15–45 years)	Iron	(μmol/mol) Using ZP	17.9	10.4
Pregnant women (15–45 years)	Iron	(μmol/mol) Using ZP	8.3	
Adult men (20–55 years)	Iron	(μmol/mol) Using ZP	5.5	
Preschool children (3–6 months)	Iron	(μg/ml) Using TfR	61.5	50.9
Schoolchildren (2–12 years)	Iron	(μg/ml) Using TfR	23.0	29.6
Nonpregnant women (15–45 years)	Iron	(μg/ml) Using TfR	32.4	26.1
Pregnant women (15–45 years)	Iron	(μg/ml) Using TfR	26.7	
Adult men (20–55 years)	Iron	(μg/ml) Using TfR	2.4	7.1

Source: Authors' compilation.

Table A.4 Summary of specifications of micronutrient standards for common fortified foods in Malawi

Commodity specified by MBS	Ed 1	Fortification requirements at production and during importation (mg/kg)	Fortification requirements during marketing (mg/kg)	Ed 2	Fortification requirements at production and during importation (mg/kg)	Fortification requirements during marketing (mg/kg)	Ed 3	Fortification requirements at production and during importation (mg/kg)	Fortification requirements during marketing (mg/kg)	Fortification requirements at household level (mg/kg)	Act and gazette
	Wheat MS 32										
Folate	1985		2011 **Iron= 27–51 at all levels; Vit A = 0.6–1.4 (prod);** **0.5–1.4 (retail) 0.4 – 1.4 (HH)**		2.0	1.1	2013				Act No. 14 of 2012 Gazette Feb 2015
Iron					30	27					
Vit B-12					0.020	0.01					
Vit B-1					9.0	4.6					
Vit B-2					6.0	3.3					
Niacin					50	30					
Zinc					80	60					
Vit A					1.0	0.5					
	Maize MS 34										
Folate	1985			2001		2011 Iron = **21–41 at all levels** **Vit A = 0.6–1.4 (Prod)** **0.5–1.4 (retail)0.4–1.4 (HH)**		1.0	0.6		Act No. 14 of 2012 Gazette Feb 2015
Iron								20	21		
Vit B-12								0.015	0.007		
Vit B-1								4.5	3.0		
Vit B-2								3.0	2.0		
Niacin								25	15		
Zinc								40	53		
Vit A								1.0	0.5		

Table A.4 Continued

Commodity specified by MBS	Ed 1	Fortification requirements at production and during importation (mg/kg)	Fortification requirements during marketing (mg/kg)	Ed 2	Fortification requirements at production and during importation (mg/kg)	Fortification requirements during marketing (mg/kg)	Ed 3	Fortification requirements at production and during importation (mg/kg)	Fortification requirements during marketing (mg/kg)	Fortification requirements at household level (mg/kg)	Act and gazette
	White sugar MS 202										
Vitamin A	1989						2011	15 (2013) **8–22**	6 (2013) 6–22	 4–22	Act No. 14 of 2012 Gazette Feb 2015
	Raw sugar MS 209										
Vitamin A	1990						2011	15 (2013) 8–22	6 (2013) 6–22	 4–22	Act No. 14 of 2012 Gazette Feb 2015
	Salt MS 188										
Iodine	1988			1999	80–100	50	2008	48–60	30–60	15–60	Chapter 52:02 Gazette Feb 15, 1999
	Edible oils MS 51										
	1985			2001	30–40 at the production level	20–40 at the retail level and 14–40 at the household level	2011				Act No. 14 of 2012 Gazette Feb 2015

Source: Malawi Micronutrient Strategy (MBS 2013).

Table A.5 Summary of major legislation shaping micronutrient policies and strategies

Major food and nutrition policy statements	Goals, objectives or targets related to nutrition	Strategies and activities related to nutrition	Policy topics	Partners in policy implementation
National Nutrition Policy (NNP) 2016–2020	The NNP will provide guidelines that will facilitate promotion of adequate nutrition for all Malawians in a comprehensive and coordinated manner. The policy has identified seven priority areas aimed at (i) prevention; (ii) treatment; (iii) provision of an enabling environment; (iv) nutrition-related noncommunicable diseases; (v) targeted nutrition programming; (vi) nutrition research and surveillance; and (vii) protection, participation, and empowerment. Each priority area comprises policy statements that outline the perceived areas of focus for an operational link between the policy and a separate National Nutrition Strategic Plan (NNSP) that outlines the operational strategies.	The policy shall operate in an environment that has other legislations that touch on nutrition-related issues, such as the Consumer Protection Act; the Pharmacy Medicines and Poisons Act; the Malawi Bureau of Standards Act; the Public Health Act; the Health and Welfare Act; the Prevention of Domestic Violence Act; the Child Care Justice and Protection Act; the Persons with Disabilities Act; and the Local Government Act. The policy is guided by the international human rights instruments that Malawi is party to at the regional and global levels, such as: (i) the International Covenant on Economic, Social, and Cultural Rights (ii) the Convention on the Elimination of All Forms of Discrimination Against Women (iii) the Convention on the Rights of the Child (iv) the African Charter on Human and Peoples Rights and its relevant protocols (v) the South African Development Community Protocol on Gender and Development (vi) the Declaration of Commitment on HIV and AIDS: “Global Crisis—Global Action” (vii) Universal Access (viii) the Maputo Declaration on Tuberculosis, HIV and AIDS, Malaria, and Other Related Infections	The purpose of the policy is therefore to facilitate: (i) evidence-based reprogramming and strengthening of the national nutrition response, while recognizing emerging issues, gaps, challenges, and lessons learned over the duration of the implementation of the NNPSP (ii) scaling up of evidence-based innovative interventions (iii) realignment of the nutrition interventions to the current government development agenda and the Scaling Up of Nutrition.	DNHA, public sector, civil society, private sector, and NGOs DNHA, MoH, Ministry of Local Government and Rural Development, MoAFS

Table A.5 Continued

Major food and nutrition policy statements	Goals, objectives or targets related to nutrition	Strategies and activities related to nutrition	Policy topics	Partners in policy implementation
National Food Fortification Logo Guidelines 2015 (not approved)	The guidelines describe the policies and procedures that govern the approval for the use of the food fortification logo (FFL) on fortified food products.	The guidelines cover the application, issuance, and use of the logo in labeling fortified foods produced in accordance with the national standards. Manufacturers of commonly consumed foods (salt, sugar, edible oil, wheat, and maize flours) shall be required to fortify their products. Manufacturers of other food products wishing to fortify their products voluntarily are encouraged to do so after consulting with NFA to receive guidance on the appropriate micronutrients and fortification levels. All food manufacturers producing products fortified with micronutrients shall be encouraged to use the FFL in their packaging.	The management of FFL shall be the responsibility of the FFL Committee, chaired by MOIT.	OPC, DNHA, MoIT, Food Fortification Coordinator, MBS, NFA, MoH (Environmental Health), Consumer Association of Malawi
National Micronutrient Strategy (NMS) for Malawi 2013–2018	The goal of the strategy is to operationalize the Nutrition Policy and Nutrition Strategy. The government has developed the micronutrient strategy as one way of combating micronutrient deficiencies in the country.	The strategy promotes a multistakeholder and a multisectoral response to reduce micronutrient deficiencies and other forms of nutrition disorders. It is expected to facilitate the broader response and action by using the various implementation mechanisms and building a strong commitment toward addressing nutrition disorders. The strategy has six major focus areas: dietary diversification, biofortification, fortification, supplementation, social marketing, and communication and other public health measures.	Dietary diversity and biofortification are a long-term, sustainable way to address micronutrient deficiencies; food fortification is a medium-term intervention; and micronutrient supplementation is a short-term micronutrient intervention; public health, social marketing, and nutrition education	Project Healthy Children, UNICEF, Irish Aid

Table A.5 Continued

Major food and nutrition policy statements	Goals, objectives or targets related to nutrition	Strategies and activities related to nutrition	Policy topics	Partners in policy implementation
Food Security Action Plan The Ministry of Agriculture and Food Security—008	The overall objectives of the Food Security Action plan are to: i. Assist in coordinating the Food Security Policy (FSP) with the National Nutrition Policy. ii. Enhance the collaboration between the projects and the government, both at the central and the district level. iii. Ensure complementarity and support the policy process. The specific objectives are: i. Prioritize the strategies in the FSP that should be implemented immediately at the ground level (in line with ADP objectives). ii. Develop approaches/modalities for reorienting ongoing projects and programs or pipeline projects (in line with the ADP process).	A. Improve staple food availability at the household and national levels. 1. Promote contract farming for agricultural production development. 2. Encourage domestic production of high-quality improved varieties. 3. Promote integration of livestock into smallholder farming systems. 4. Create conducive environment for private-sector investment and local community participation in irrigation development. 5. Promote environment, land, and water management for sustainable agricultural development. B. Increase food access at the household level. 6. Promote off-farm employment opportunities through economic empowerment and programs. C. Improve stability at the national level. 7. Establish community grain banks.	Vitamin A HIV/AIDS and nutrition Food safety Food security and agriculture Household food security Taxation and price policies	• Government • Food and agriculture • Ministry of Agriculture and Food Security • Finance, budget, and planning • Ministry of Economic Planning and Development • Ministry of Local Government and Rural Development • District authority • Other ministries • Bilateral and donor agencies and lenders • National NGOs • Farmers/farmer unions • Civil society

Table A.5 Continued

Major food and nutrition policy statements	Goals, objectives or targets related to nutrition	Strategies and activities related to nutrition	Policy topics	Partners in policy implementation
National Nutrition Policy and Strategic Plan DNHA— March 2009	The goal of the policy and strategic plan is to have a well-nourished Malawi nation with sound human resources that effectively contribute to the economic growth and prosperity of the country. Objectives: Objective 1: To prevent and control the most common nutrition disorders among women, men, boys, and girls in Malawi by 2011 with an emphasis on vulnerable groups. Objective 2: To increase access to timely and effective management of the most common nutrition disorders among women, men, boys, and girls in Malawi by 2011, with an emphasis on vulnerable groups. Objective 3: To create an enabling environment for the effective implementation of nutrition services and programs between 2007 and 2011.	P1. Promotion of optimal breastfeeding practices for children 0–6 months in the context of HIV/AIDS at the facility, community, and household levels. P2. Promotion of optimal feeding practices for children 6–24 months or beyond to sustain breastfeeding while giving appropriate complementary feeds, with an emphasis on feeding frequency, amount, energy and nutrient density, and diversity based on the six food groups. P3. Strengthen optimal feeding of a sick child during and after illness. P4. Promote women's nutritional status among the general public. P5. Prevent and control micronutrient deficiency disorders, with an emphasis on vitamin A deficiency, anemia, and iodine deficiency disorders. P6. Promote practices that promote healthy lifestyles, food availability, diversity, access, proper storage, preparation, use, the consumption of a variety of foods from the six food groups every day, safety and quality in the general population. P7. Promote access to at least one nutritious meal and related health and nutrition services for school-going children through the school feeding and the school health and nutrition programs. P8. Strengthen capacities for households and communities to attain adequate nutrition for their families, with an emphasis on socioeconomically deprived persons. P9. Promote food safety and quality. P10. Control nutrition-related noncommunicable and other diseases.	Stunting Wasting Underweight Low birth weight Maternal undernutrition Diet-related noncommunicable diseases Growth monitoring and promotion Nutrition education / counseling Physical activity and healthy lifestyle Promotion of fruit and vegetable intake Food-based dietary guidelines Breastfeeding: Early initiation by 1 hour Breastfeeding: Exclusive 6 months Breastfeeding: Continued Baby-friendly hospital initiative Breastfeeding in the context of HIV Complementary feeding Vitamin A Iron and folic acid Unspecified micronutrient supplementation Food fortification Maize flours Refined sugar Food-grade salt Edible oils and margarine Food distribution/supplementation Food safety Food security and agriculture Home, school, or community gardens Household food security School feeding programs	• Government • Cabinet/Presidency • DNHA chair • Health • Ministry of Health • Food and agriculture • Ministry of Agriculture and Food Security • Education and research • Ministry of Education • Women, children, families • Ministry of Women and Child Welfare Development • Finance, budget, and planning • Local government • Trade • Ministry of Industry and Trade • Information • Ministry of Information and Civic Education • Subnational • Other • Ministry of Finance • UN • UNICEF • Intergovernmental bodies • European Union • Ministry of Science and Technology

Table A.5 Continued

Major food and nutrition policy statements	Goals, objectives or targets related to nutrition	Strategies and activities related to nutrition	Policy topics	Partners in policy implementation
		M1. Promote access to and quality of nutrition and related services to facilitate effective management of nutrition deficiency disorders in under-5 children, adolescents, and adults. E1. Firmly position nutrition on the national development agenda and include nutrition in the key development programs; allocate adequate resources; strengthen institutional and human capacities; put in place necessary coordination mechanisms in all sectors for the implementation of the National Nutrition Policy and Strategic Plan at all levels. E2. Increase budgetary allocation of resources by government and partners for the implementation of the National Nutrition Policy and Strategic Plan. E3. Government shall strive to build institutional and human capacity for the effective delivery of nutrition services, including the design, development, and implementation of relevant nutrition programs, projects, and interventions in the public sector. E4. Establish a well-defined coordination mechanism for nutrition services, programs, and projects at the central, district, and community levels. E5. Government shall ensure evidence-based programming of nutrition programs, projects, activities, interventions, and services through the generation and dissemination of nutrition research information and findings and appropriate documentation and dissemination of best practices. E6. Results-oriented monitoring and evaluation.	Deworming Diarrhea / oral rehydration solution HIV/AIDS and nutrition Improved hygiene and hand washing Water / sanitation School-based health and nutrition programs Gender Vulnerable groups	

Table A.5 Continued

Major food and nutrition policy statements	Goals, objectives or targets related to nutrition	Strategies and activities related to nutrition	Policy topics	Partners in policy implementation
Food Security Policy Ministry of Agriculture and Food Security—August 2006	The long-term goal of this policy is to significantly improve the food security of the population. The goal implies increasing agricultural productivity and diversity and sustainable agricultural growth and development. 2.2 Specific Objective The specific objective of the FSP is to guarantee that all men, women, boys, and girls, especially under-5s, in Malawi have, at all times, physical and economic access to sufficient nutritious food required to lead a healthy and active life. The concept of food security implies that: (a) All Malawians at all times have both physical and economic access to enough nutritious food for an active, healthy life. (b) The ways in which food is produced and distributed should be environmentally friendly and sustainable. (c) Both the production and consumption of food are governed by social values that are just and equitable, as well as moral and ethical. (d) The ability to acquire food is ensured. (e) The food is obtained in a manner that upholds human dignity.	Sustainable Access to Food Access by individuals to adequate resources (entitlements) to acquire appropriate food for a nutritious diet. Entitlements are defined as the set of all those commodity bundles over which a person can establish a command given the legal, political, economic, and social arrangements of the community in which he/she lives, including traditional rights, for example, to access common resources. 4.1 Guarantee physical, social, and economic access to adequate food at all times 4.1.1 Promote sustainable access to adequate nutritious food and other resources at the household and national level Strategies 4.1.1.1 Formalize trade in foods and other economic products in line with bilateral, regional, and international trade agreements without compromising sanitary and phytosanitary issues 4.1.1.2 Promote traditional and cultural practices that improve food security for women and men, girls, and boys 4.1.2 Increase the purchasing power or the level of real income for all those who depend on the market as their source of food supplies Strategies 4.1.2.1 Improve market efficiencies to give the poor better prices for their products 4.1.2.2 Promote off-farm employment opportunities through economic empowerment programs and other income-generating activities	Food security and agriculture Household food security Vulnerable groups	• Government • Cabinet/Presidency • DNHA • Health • Food and agriculture • Other • National Food and Nutrition Security Joint Taskforce, will report to the Cabinet Committee on Agriculture and Natural Resources on matters of food security and to the Cabinet Committee on the Economy for nutrition issues

Table A.5 Continued

Major food and nutrition policy statements	Goals, objectives or targets related to nutrition	Strategies and activities related to nutrition	Policy topics	Partners in policy implementation
		4.1.2.3 Promote equitable distribution of income, especially for women, through the improvement of their knowledge of the market functions 4.1.3 Transform subsistence producers into commercial-oriented producers Strategies 4.1.3.1 Maximize the potential for earnings from assets of subsistence producers by helping poor farmers to find better markets 4.1.3.2 Promote equitable distribution of assets within the household through a clear ownership of assets 4.1.2.3 Support producers to combat theft in rural areas through expanding community policing system 4.1.4 Improve delivery of social support to the poor and socioeconomically vulnerable individuals Strategies 4.1.4.1 Ensure transparent and cost-effective delivery of social economic support functions 4.1.4.2 Improve targeting mechanisms for the delivery of safety net programs, including cash-based transfer 4.1.4.3 Put in place mechanisms to remove all transient obstacles to ensuring access for people cut off from the usual channels of accessing food		

Table A.5 Continued

Major food and nutrition policy statements	Goals, objectives or targets related to nutrition	Strategies and activities related to nutrition	Policy topics	Partners in policy implementation
Food and Nutrition Security Policy Ministry of Agriculture 2005	Overall Goal of Food and Nutrition Security Policy The long-term goal of this policy is to significantly improve the food and nutrition security of the population. The goal implies a rapid and substantial reduction in the degree and severity of malnutrition, in all its forms—chronic and acute malnutrition and micronutrient deficiencies—among the men, and women, boys and girls, especially under-5s, expectant and lactating mothers of the population. 2.1.1 The concept of food security implies that: (a) All Malawians at all times have both physical and economic access to enough nutritious food for an active, healthy life. (b) The ways in which food is produced and distributed should be environmentally friendly and sustainable. (c) Both the production and consumption of food are governed by social values that are just and equitable as well as moral and ethical. (d) The ability to acquire food is ensured. (e) The food is nutritionally adequate and personally and culturally acceptable. (f) The food is obtained in a manner that upholds human dignity.	Sustainable Access to Food 4.1 Food Access Access by individuals to adequate resources (entitlements) to acquire appropriate food for a nutritious diet. Entitlements are defined as the set of all those commodity bundles over which a person can establish a command given the legal, political, economic, and social arrangements of the community in which he/she lives, including traditional rights—for example, access to common resources. 4.2 Guarantee physical, social and economic access to adequate food at all times 4.2.1 Promote sustainable access to adequate nutritious food and other resources at the household and national levels Strategies 4.2.1.1 Formalize trade in foods and other economic products in line with bilateral, regional, and international trade agreements without compromising sanitary and phytosanitary issues 4.2.1.2 Promote traditional and cultural practices that improve food and nutrition security for women and men, girls and boys and food technology 5.2.3 Promote the control, prevention and treatment of micronutrient deficiency disorders, particularly those caused by vitamin A, iodine, and iron deficiencies Strategies 5.2.3.1 Encourage production and consumption of micronutrient-rich foods.	• Stunting • Wasting/management of SAM or MAM • Maternal undernutrition • Adult obesity • Child obesity • Diet-related noncommunicable diseases • Nutrition education/counseling • Physical activity and healthy lifestyle • Food-based dietary guidelines • Breastfeeding in the context of HIV • Vitamin A • Iodine • Iron • Food fortification • Food security and agriculture • Household food security • HIV/AIDS and nutrition • Nutrition and malaria • Water/sanitation • School-based health and nutrition programs • Vulnerable groups	• OPC • Health • Ministry of Health • Food and agriculture • Ministry of Agriculture and Food Security • Social welfare • Ministry of Gender, Children, Disability, and Social Welfare • Finance, budget, and planning • Ministry of Economic Planning and Development • Ministry of Finance • Development • Ministry of Local Government and Rural Development • Trade • Ministry of Industry and Trade • Private Sector Development • Other • Department of Poverty and Disaster Management Affairs

Table A.5 Continued

Major food and nutrition policy statements	Goals, objectives or targets related to nutrition	Strategies and activities related to nutrition	Policy topics	Partners in policy implementation
	2.1.2 Primary Objective of Food Security The primary objective of food security is to guarantee that all men, women, boys, and girls, especially under-5s, in Malawi have, at all times, physical and economic access to sufficient nutritious food required to lead a healthy and active life. 2.1.3 The concept of nutrition security implies that: a) Healthy food choices and lifestyles are easy choices for all Malawians. b) There is absence of all forms of malnutrition—that is, protein energy, micronutrient, and overnutrition. c) All Malawians should have access to services for the prevention, timely treatment, and proper management of malnutrition and infectious diseases. d) Good nutrition and its role in the context of a healthy lifestyle are a fundamental part of achieving social justice and poverty reduction. 2.1.4 Primary Objective of Nutrition Security The primary objective of nutrition security is to significantly improve health and nutritional status to lead an active healthy life and reduce the burden of diet-related illness, death, and disability among men, women, boys, and girls living in Malawi.	5.2.3.2 Develop and enforce mandatory guidelines on food fortification 5.2.3.3 Strengthen supplementation of micronutrients in under-5 children, school-aged children, and pregnant and postpartum mothers 5.2.3.4 Promote community-based technologies for fortification 5.2.4 Promote control, prevention, and treatment of diseases that have a direct impact on nutrition and health status Strategies 5.2.4.1 Facilitate the implementation of the Essential Health Package 5.2.4.2 Strengthen counseling services for management of nutrition-related diseases, especially for symptoms of common HIV/AIDS-related illnesses 5.2.4.3 Provide counseling services on infant and young child feeding, especially in the context of HIV/AIDS 5.2.4.4 Encourage early health care–seeking behaviors among all people who are sick, especially those living with HIV/AIDS 5.2.4.5 Facilitate dissemination of information and support to clients on medical treatment (including antiretrovirals) to ensure adherence 5.2.4.6 Facilitate implementation of water supply and sanitation programs 5.2.4.7 Promote and support palliative care and community coping mechanisms for HIV-positive and HIV-affected households 5.2.4.8 Promote implementation of national guidelines for management of moderate and severe malnutrition		

Table A.5 Continued

Major food and nutrition policy statements	Goals, objectives or targets related to nutrition	Strategies and activities related to nutrition	Policy topics	Partners in policy implementation
		5.2.5 Increase access to and availability of services and information to prevent consumers from health hazards Strategies 5.2.5.1 Review and enforce national legislation and regulations according to the international Sanitary and Phytosanitary agreements 5.2.5.2 Establish comprehensive food control systems at all levels that include risk analysis to ensure safety in the entire food chain 5.2.5.3 Regulate development and use of modern biotechnology, including genetically modified organisms and genetically engineered seeds and substances in order to enhance biosafety 5.2.6 Promote the consumption of adequate food in both quality and quantity to meet nutritional needs for rural and urban households, with a special emphasis on vulnerable groups Strategies 5.2.6.1 Facilitate the implementation of the national nutrition strategy 5.2.6.2 Strengthen the implementation of the School Health and Nutrition program 5.2.6.3 Build a capacity for communities to adequately care for the socioeconomically deprived and the nutritionally vulnerable groups 6.0 Stability in Food and Nutrition 6.1 Food stability To be food secure, a population, household, or individual must have access to adequate food at all times. They should not be at risk of losing access to food as a consequence of an economic or climatic crisis or seasonal food variations. The concept of stability		

Table A.5 Continued

Major food and nutrition policy statements	Goals, objectives or targets related to nutrition	Strategies and activities related to nutrition	Policy topics	Partners in policy implementation
		can therefore refer to both availability and access to food. 6.2 To guarantee that every individual has adequate and nutritious food that is accessible at the required time and in useable form. 6.2.1 Improve the management of disasters. Strategy 6.2.1.1 Promote a coordinated approach to disaster preparedness and management. 6.2.1.2 Ensure allocation of adequate resources to disaster management. 6.2.1.3 Improve a system of assessing possibilities of a shock.		
HIV/AIDS Agriculture Sector Policy and Strategy Ministry of Agriculture and Irrigation 2003	Agriculture sector should promote processing, use, and production of high-nutritive-value crops such as quality protein maize, soya beans, dark green vegetables, and fruits; and livestock, such as rabbits, poultry, and goats. - Agriculture sector should promote food banks in order to ensure food security. - Extension services in collaboration with development agencies should encourage the establishment of community feeding programs for the most vulnerable groups. - Extension services should promote dietary diversification and its acceptability by the communities. - Extension services should bring awareness on the actual impact of HIV/AIDS on nutrition and food security.	Strategies - Build community-based capacity in food processing and nutrition education - Empower communities through diversified income-generating activities - Mobilize communities to diversify food production and food banks - Support water-harvesting technologies to increase off-season crop production - Develop food-processing technologies to expand on agro-based industry and household food availability - Develop an effective farmer/extension/research linkage 4.5.3 Major Actions - Advocate for the consumption of high-nutritive-value food - Develop backyard gardens - Train extension workers and staff in income-generating activities - Establish income-generating activities to enable households and communities to get money for buying enough food - Establish community food banks	Nutrition education/counseling Food distribution/supplementation Food security and agriculture Household food security HIV/AIDS and nutrition	Cabinet/Presidency National AIDS Commission Health District community and village AIDS committees Food and agriculture Ministry of Health and Population and other health providers Malawi Agriculture Sector on HIV/AIDS National NGOs Peer educators, counselors, and other support groups

	- Agriculture sector should conduct research in high-nutritive-value crops and livestock.	- Conduct research into local dietary recipes		
Infant and Young Child Nutrition Policy and Guidelines Ministry of Health and Population 2003	The Infant and Young Child Nutrition Policy has been developed as an integral part of Essential Health Package, safety nets, and nutrition subcomponents of the PRSP. This policy guides program coordinators/managers, policy makers, health workers, and other stakeholders dealing with infants, young children, and mothers on how to implement nutrition program activities. Program Goal To contribute to improved infant and young child nutrition for survival, growth, and development. Program Objectives 1. To increase the rate of exclusive breastfeeding among infants for the first 6 months of life 2. To reduce mother-to-child transmission of HIV caused by breastfeeding 3. To provide caregivers with knowledge and enhance skills on timely, appropriate, and adequate complementary feeding 4. To ensure that the nutritional needs of infants and young children and their mothers in emergency-affected populations are addressed 5. To strengthen nutrition surveillance at all levels	A. Infant and young child feeding in the first 2 years of life B. Infant and young child feeding and HIV/AIDS C. Infant and young child feeding in emergency situations D. Replacement feeding in emergency situations E. Prevention and control of micronutrient deficiencies i. Supplementation ii. Fortification iii. Dietary diversification iv. Public health F. Growth monitoring and promotion G. Management of moderately and severely malnourished children and mothers i. Management of moderate acute malnutrition (supplementary feeding) ii. Management of severe acute malnutrition (therapeutic feeding)	Wasting/Management of SAM or MAM Maternal undernutrition Growth monitoring and promotion Nutrition education/counseling Breastfeeding Breastfeeding: Exclusive 6 months Breastfeeding: Continued Baby-friendly Hospital Initiative Breastfeeding in the context of HIV Complementary feeding International Code of Marketing of Breast-milk Substitutes Vitamin A Iodine Iron Iron and folic acid Food fortification Food-grade salt Edible oils and margarine Maternity protection	Government Health Ministry of Health and Population UN UNICEF WHO International NGOs Family Health International Academy for Education and Development/Linkages World Vision International World Vision Malawi: MICAH Project

Table A.5 Continued

Major food and nutrition policy statements	Goals, objectives or targets related to nutrition	Strategies and activities related to nutrition	Policy topics	Partners in policy implementation
	6. To enhance good nutritional status for all women of the reproductive age 7. To improve management of moderately and severely malnourished infants, young children, and mothers 8. To increase access to micronutrients by infants, young children, and mothers			
National Plan of Action for Nutrition Ministry of Agriculture, Irrigation, and Water Development Vice president approved the changes in 2000.				

Source: The Global Database on the Implementation of Nutrition Action (GINA); NNPSP (2009).

Notes: DNHA: Department of Nutrition, HIV, and AIDS; NGOs: Nongovernmental Organization; MoH: Ministry of Health; NNSP: National Nutrition Strategic Plan; OPC: Office of the President and the Cabinet; MoIT: Ministry of Industry and Trade; NFA: National Fortification Alliance, UNICEF: : The United Nations Children's Fund; HIV: Human Immunodeficiency Virus Infection; AIDS: Acquired Immune Deficiency Syndrome; UN: United Nations; WHO: World Health Organization; MICAH: Micronutrient and Health Program

APPENDIX B: INTERVIEW INFOMATION

Box B.1 Key informant interview guide

Policy Institutions

Who takes the key micronutrient policy decisions? Parliament? Cabinet? MoH?

Who is responsible for implementation, monitoring, assessment of micronutrient policies?

- iodine
- vitamin A
- iron
- multimix fortification of maize flour
- others (calcium, B vitamins)

Who finances Malawi's major micronutrient interventions?

What venues exist for engaging stakeholder comment, suggestions, and preferences?

What policy frameworks exist to legislate accountability?

Why so many individual taskforces (VAD, IDD, IDA)? Who funds them? Initiates them?

What legal/moral standing do they have? What human and financial resources?

When did Malawi's key micronutrient interventions get onto the policy agenda?

- iodine
- vitamin A
- iron
- multimix fortification of maize flour
- others (calcium, B vitamins)

How did they get onto the policy agenda when they did?

- iodine
- vitamin A
- iron
- multimix fortification of maize flour
- others (calcium, B vitamins)

Interview Guide for Specific Micronutrient Interventions (vitamin A, iron, iodine, mixed)

1. <u>Agenda setting</u>

How did this micronutrient policy (iodine, vitamin A, iron, vitamin mix) get on the agenda when it did?

K1.1. What advocates?

K1.2. What focusing events?

Who championed this cause?

- domestic advocates
- international advocates

Who opposed it?

K1.3. Why was this considered a priority issue? (relevant problem)

Box B.1 Continued

2. <u>Design</u>
Who designed the policy intervention?
What design options were considered?
Why did designers choose (a) supplementation, (b) fortification (of what?), (c) biofortification?
What is the annual cost?
Who finances the cost?
K2.3. How cost-effective are the various alternatives?
K2.1. Was this a pressing or a chosen problem?
K2.2. What ideas and beliefs underlie the chosen design?

3. <u>Decision making</u>
Who made the final decision?
Who lobbied in favor?
Who opposed it?
K3.1. What factors led to a favorable decision? (Propitious timing?)
K3.2. What veto players exist?
K3.3. Evaluate the relative power of the proponents and opponents.

4. <u>Implementation</u>
Who implements?
What regulatory and legislative changes took place to implement the policy decision?
What institutional oversight is there?
Did this policy require setting up new institutions?
Any policy changes since introduction? When? Why?
K4.1. Institutional capacity of implementing institution
K4.2. Commitment of policy makers
K4.3. Budget resources: What cost? Who pays? Are the resources sustainable?

5. <u>Evaluation and reform</u>
Who monitors the impact of this policy (iodine, vitamin A, iron, vitamin mix)?
Any other relevant research bearing on this policy?
K5.1. Did changing conditions lead to policy change?
K5.2. Changing beliefs? Did understanding or awareness change?
K5.3. Did resource constraints trigger reform?

Table B.1 List of persons interviewed for Malawi case study

Number	Name	Organization	Role	Telephone	Email
1	Felix Pensulo-Phiri	Department of Nutrition, HIV, and AIDS (DNHA)	Director of Nutrition	+265 99 995 3747	felixphiri8@gmail.com;
2	Mzondwase Agnes Mgomezulu	Ministry of Agriculture, Irrigation, and Water Development	Deputy Director Nutrition	+265 99 555 6444	mzondwa22@hotmail.com
3	Harry Mwamlima	Ministry of Finance	Director	+265 99 949 5593	MwamlimaHarry@yahoo.co.uk
4	Tisungeni Zimpita	Civil Society Organisation on Nutrition Alliance (CSONA)	Project Manager	+265 99 484 7088	Tisungeni.Zimpita@concern.net
5	Virginia Mzunzu	CSONA	Project Officer	+265 99 919 6214	virginia.mzunzu@concern.net
6	Babiette	Civil Society Agriculture Network			babettie@cisanetmw.org
7	Geoff Mkandawire	Illovo Sugar Ltd.		+265 99 996 3111	gmkandawire@illovo.co.za
8	Julita Manda	World Bank/Canada	Adviser, Nutrition	+265 99 575 748	julitamanda@yahoo.com
9	Katja Altincicek	GIZ	Technical Adviser	+265 88 461 1796	katja.altincicek@giz.de
10	Phillip Makhumula	UNICEF	Nutritionist	+265 99 157 3805	pmakhumula@unicef.org pmakhumula@yahoo.com
11	Violet Orchardson	USAID	Nutritionist	+265 99 920 2700	VOrchardson@usaid.gov
12	Alexander Kalimbira	LUANAR	Associate Professor of Human Nutrition	+265 99 960 3359	akalimbira@bunda.luanar.mw
13	Alice Nkoroi	Food and Nutrition Technical Assistance (FANTA) Project	Country Manager	+265 99 340 2671	ankoroi@fhi360.org
14	Susan Mwafulira	DNHA			
15	Ruth Mwandira	Department for International Development	Health and HIV/AIDS Adviser	+265 888221229	r-mwandira@dfid.gov.uk
16	Margaret Lwanda	Ministry of Agriculture and Food Security	Deputy Director of Nutrition	+265 99 951 0589	MargieLwanda@yahoo.com
17	Martha Mwale	Ministry of Agriculture			
18	Sylvester Gawamadzi	DNHA	Chief Planning Officer	+265 88 830 5551	sgawamadzi@gmail.com
19	Rodah Morezio Zulu	CIAT	Nutritionist: Bean Programme	+265 993 772 252	r.m.zulu@cgiar.org
20	Enock K. Maereka	CIAT	Seed Business Development Specialist	+265 993 390 568	e.maereka@cgiar.org ekmaereka@yahoo.co.uk

Table B.1 Continued

Number	Name	Organization	Role	Telephone	Email
21	Rowland Morgan Chirwa	CIAT	Coordinator CIAT Southern African Bean Research Network	+265 999 962 851	r.chirwa@cgiar.org
22	Benson Mzembe Kazembe	UNICEF	Nutrition Officer: Micronutrients	+265 999 737 707	bkazembe@unicef.org
23	Mary Shawa	Ministry of Gender, Children, Disability and Social Welfare	Principal Secretary	+265 999 957 992	mnyajere@gmail.com
24	Charles Mazinga	Ministry of Gender, Children, Disability, and Social Welfare	Deputy Director of Nutrition and HIV/AIDS	+265 992 238 700	charlesmazinga@gmail.com
25	Kondwani Mpeniuwawa	DNHA	Chief Nutrition Programmes Officer	+265 999 454 954	mpeniuwawa@gmail.com
26	Frank Mshisha	Ministry of Health			msiskafrank@yahoo.com
27	Jellita Gondwe	National Nutrition Reference Lab			Jelitagondwe@gmail.com
28	Harry Mwamlima				
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Source: Authors' compilation.

Notes: DNHA: Department of Nutrition, HIV, and AIDS; CSONA: Civil Society Organisation on Nutrition Alliance; GIZ: UNICEF: The United Nations Children's Fund; USAID: United States Agency for International Development; LUANAR: Lilongwe University of Agriculture and Natural Resources; FANTA: Food and Nutrition Technical Assistance; CIAT: International Center for Tropical Agriculture

APPENDIX C: KALEIDOSCOPE HYPOTHESIS TESTING DETAILS AND DATA MATRICES

Table C.1 Iodine hypothesis testing details

Date:	**1988–1994**	**1995–2006**	**2006–2012**	**2012–2015**
Actors:	**UNICEF, MoH**	**UNICEF, MoH, MBS**	**DNHA, OPC**	**DNHA, MoH, UNICEF, Parliament**
Policy action:	MoH and UNICEF, advance fortification proposals. First edition of salt specification published in 1988 but no mention of iodine specification	The Salt Iodization Bill was passed in 1995 and the act was released in 1988); mandated fortification of imported and domestically sold salt (AK; TG): household: 15–30 ppm; port: 35–80 ppm; market: 30–60 ppm (JG)	NNPSP sets target to increase use of iodized salt to 90 percent by 2012. In 2007, Ministry of Education developed a strategy to address high rates of IDD in schoolchildren (CM). 15 ppm as standard (NNPSP 2007–2012) Essential Nutrition Actions(ENA) proposes to tackle IDD (NNPSP)	Development of a micronutrient strategy. Unclear whether revised standards have been passed through Parliament, but it was under revision in 2014. The language was revised, and the actual levels were revised to meet ECSA guidelines. Malawi's levels were high, so they have been reduced a bit (KM).
1. Agenda setting				
1.1. Focusing events	ICN1 in 1992—pledge to eliminate IDD	World Child Summit in 1990 and ICN1 in 1992 played a major role in raising awareness on issues of IDD (PM).	2006 study found high rates (50 percent among schoolchildren) of IDD in school-aged children.	2008 study showed that there were still high levels of IDD because monitoring has not been managed well (PM).
1.2. Powerful advocacy coalitions	UNICEF, WHO, and USAID begin to support	UNICEF, WHO, and other donors provide external support to MOH.	UNICEF, MOH	
1.3. Recognized, relevant policy problem: How did this become a pressing priority for action?	1989 survey in 10 districts reported a total goiter rate of 12.7 percent (Maleta 2006). 1989 review of iodine supplementation survey showed that 56 percent of the 177,137 women and children examined in some districts in Malawi from 1983 to 1989 had goiter (Maleta 2006); World Summit for Children (1990) set goal of elimination of IDD.	Knowledge gap recognized at household level (NNPSP)	School health and nutrition baseline survey conducted in 2006 found high rates of IDD (CM); mental impairment caused loss in future wages of US$71 million	

Table C.1 Continued

Date:	**1988–1994**	**1995–2006**	**2006–2012**	**2012–2015**
Actors:	**UNICEF, MoH**	**UNICEF, MoH, MBS**	**DNHA, OPC**	**DNHA, MoH, UNICEF, Parliament**
2. Design				
2.1. Pressing versus chosen problems	Pressing problem because of the results of the study	Chosen	Chosen	Chosen
2.2. Ideas and beliefs			NNPSP (2007) Multiple Indicator Cluster Survey recognized the economic and social consequences of IDD	
2.3. Cost-benefit calculations	Since 90 percent of salt was imported, the iodization strategy could be mandated.			
3. Adoption				
3.1. Propitious timing				
3.2. Veto players	None	None	None	None
3.3. Relative power of proponents versus opponents	None	No serious opponents	No serious opponents	

Table C.1 Continued

Date:	1988–1994	1995–2006	2006–2012	2012–2015
Actors:	**UNICEF, MoH**	**UNICEF, MoH, MBS**	**DNHA, OPC**	**DNHA, MoH, UNICEF, Parliament**
4. Implementation				
4.1. Institutional capacity		The human capacity is available for monitoring; however, the necessary equipment and physical capacity is lacking	Schoolchildren are encouraged to bring salt from their homes, and rapid testing kits are used to determine if salt is iodized (CM). The rapid testing kits are not sufficient for measuring levels of iodine (AK). Government capacity to gap for monitor salt imports enforce legislation, test iodine level in market (NNPSP).	
4.2. Requisite budgetary allocations	USAID	USAID	USAID funded MOH	USAID continues to support monitoring of salt iodization (JG).
4.3. Commitment of policy champions			During this period, high-level commitment to nutrition policy existed (MS). The president recognized the problem and fully supported DNHA (FP).	UNICEF continues to play a key role in monitoring salt iodization. USAID supports the CHISU lab through UNICEF (JG).
5. Evaluation and reform				
5.1. Changing conditions			50 percent of population have no access to iodized salt (NNPSP).	Changes in government have slowed the finalization of the nutrition strategy (KM).
5.2. Changing information or beliefs of veto players and champions	World Summit for Children in 1990 and ICN1 in 1992 helped donors focus on micronutrients deficiencies, including IDD.		There might be challenges of overiodization among the urban poor because people in low-income areas buy salt more frequently. The quantity of iodine at production is higher as it caters for a long shelf life (AK).	ECSA standards revised; Malawi is revising its own standards to comply with regional standards (KM). The problem of overiodization is recognized but not addressed.
5.3. Available resources relative to cost				Still dependent on donor support for funding of monitoring

Source: Authors' compilation.

Note: UNICEF: The United Nations Children's Fund; MoH: Ministry of Health; MBS: Malawi Bureau of Standards; DNHA: Department of Nutrition, HIV, and AIDS; OPC: Office of the President and the Cabinet; ECSA: East and Central Africa.; ICN: International Conference on Nutrition; IDD: Iodine Deficiency Disorder; USAID: United States Agency for International Development; WHO: World Health Organization; NNPSP: National Nutrition Policy and Strategic Plan; CHISU: Central Health Information Services Unit

Table C.2 Vitamin A fortification of sugar: Key policy actions: 1996: Ministry of Health and UNICEF take series steps to fortify sugar

Vitamin A				
				Comments and alternate hypotheses
Date/Phases:	**Pre-1996–2002**	**2003–2008**	**2009–2015**	
Actor: Policy action:	MoH First edition of sugar specification published in 1989 (white sugar) and in 1990 (raw sugar), but no mention of vitamin A specification. MoH and UNICEF advance fortification proposals in 1996. When MoH recognized vitamin A as a major concern, a multisectoral committee was formed for nutrient deficiency disorders (NDDs) National micronutrient survey in 2001, as recommended by MDD committee	MoH/MBS/MoIT/UNICEF 2003: MBS setting standards and issues orders to Illovo for fortification of sugar with Vitamin A through MoIT. Policy focus on vitamin A supplementation increased coverage to children under 5; lactating mothers, pregnant women (NNPSP) Biannual Child Health Days introduced in 2005 (NNPSP) In 2008, memorandum of understanding signed between Illovo Sugar Ltd. and government of Malawi Duty-free import of vitamins 2007-2012, NNPSP aims to reduce under-five VAD from 59% to 40% and school age children from 88% to 25%. 2007 DNHA/OPC announces that all major processed foods including sugar will be fortified.	MoH/DNHA/Parliament Sugar fortification becomes a law and gazetted. DNHA in MoH responsible for overseeing food-fortification programs (GoM 2015) 2012 Act 14 passed for fortification of processed foods. In 2013, second edition of sugar specification mentions 15 mg/kg and 6 mg/kg of vitamin A at production and marketing stages, respectively.	

Table C.2 Continued

Vitamin A				
				Comments and alternate hypotheses
Date/Phases:	**Pre-1996–2002**	**2003–2008**	**2009–2015**	
1. Agenda setting				
1.1. Focusing events	In 1990, World Summit for Children set goal for virtual elimination of vitamin A deficiency (Herforth 2007). MoH recognized wide prevalence of vitamin A deficiency in 1996 (GM 2015). 2001: Drought and resulting hunger and malnutrition are seen as focusing event, but the results of Save the Children survey of two districts triggered 2001 survey. Save the Children, UNICEF, Irish Aid, USAID, MoH, DNHA are local champions. 2001: President Muluzi declares Malawi is in food crisis (AK). 2001 Micronutrient Survey: 60 percent of children under 5 years have VAD (NMS); 38 percent of schoolchildren have VAD (NMS); 57 percent of women of childbearing age have VAD.	National Micronutrient Strategic Plan 2003 prepared following 2001 National Micronutrient Survey. 2004: Salima Workshop on Micronutrients—Mary Shawa gets attention of ministers and follows up with another workshop in 2005.		2001 is a turning point for all MDD. Drought and hunger crisis, along with field survey results, helped mobilize action. MDD is recognized as relevant problem. Mary Shawa/Terisa Banda form coalitions with MoH, UNICEF, and other ministries.

Table C.2 Continued

Vitamin A				
				Comments and alternate hypotheses
Date/Phases:	**Pre-1996–2002**	**2003–2008**	**2009–2015**	
1.2. Powerful advocacy coalitions	Save the Children, UNICEF, Irish Aid, USAID, MoH, DNHA are local champions. 2001: President Muluzi declares Malawi is in food crisis (AK). A multisectoral Committee for MDD formed in 1996 (GoM 2015).	2005: Shawa writes to President Bingu a memo on placing nutrition centrally in OPC. President Bingu and Shawa form powerful partnership against micronutrient deficiency. MoH and UNICEF join hands to push for sugar fortification.	In 2011/12, DNHA was very active in pushing for all processed foods to be fortified.	
1.3. Recognized, relevant policy problem: How did this become a pressing priority for action?	Extreme high levels of VAD. The survey results in 2001 strengthened the resolve for addressing VAD (GoM 2015). Multisectoral committee generates momentum for 2001 survey (GoM 2015).	In 2002, problem recognized (MS) in MoH following 2001 survey results 2004: Salima Workshop (MS) 2005: Follow-up memo to president (MS) 2006: Negotiation with Illovo begins	Fortification of all major foods with processed micronutrients becomes priority for DNHA.	
2. Design				
2.1. Pressing versus chosen problems	Chosen problem from the 2001 survey (AK); results made it a pressing problem.	Chosen In 2006, DNHA uses MoIT study to advance the proposal for sugar fortification. Makes way for all major processed foods to be fortified.		
2.2. Ideas and beliefs	2001 survey points out that 70 percent of households consume sugar (AK); MoH and UNICEF recommend sugar as a vehicle. 1996–2001: Intermittent discussions between MoH, UNICEF, and sugar industry. Illovo was skeptical about feasibility, stability, quality, flexibility, and competitiveness (GM 2015).	In 2003, Illovo expressed technical problems, export sugar contamination, and uncertainty about fortification costs.	2009/10: Trial fortification; testing clears uncertainty expressed by Ilovo.	Illovo Malawi on its own travel to Zambia to see how their counterparts are handling it.

Table C.2 Continued

Vitamin A				
				Comments and alternate hypotheses
Date/Phases:	**Pre-1996–2002**	**2003–2008**	**2009–2015**	
2.3. Cost-benefit calculations		In 2002, MBS drafted sugar standard and in 2003 informed Illovo. Illovo saw this as government order. Heavy investment in operational costs	Cost of fortificant, provision of factory equipment, procurement delivery for 3 years/ only did for 2 years (GM 2015)	
3. Adoption				
3.1. Propitious timing	2001 micronutrient survey results	?	Right after the study tour in 2008, GoM and Illovo sign a memorandum of understanding and agree on fortification.	
3.2. Veto players	Illovo Malawi skeptical about the feasibility of sugar fortification, stability, quality, investment, cost, marketing cost, and competitiveness (Geoff)	Illovo management expressed serious concerns. No consultation with industry. Strong objection from Illovo for gazetting.	DNHA will not take “no” for an answer	
3.3. Relative power of proponents versus opponents		Ministry of Agriculture (second vice president) responds to Illovo and ruled out the proposal. UNICEF representative directly appeals to president and convinced him on technical grounds. Opponents failed working through politicians. In 2006, UNICEF helps with another feasibility study of MoIT and Ilovo contributed to the terms of reference.	2009/10 trial helped allay the fear of Ilovo.	

Table C.2 Continued

Vitamin A				
				Comments and alternate hypotheses
Date/Phases:	**Pre-1996–2002**	**2003–2008**	**2009–2015**	
4. Implementation			2011/12: Illovo reaching for fortification (MS) but delays in procurement.	
4.1. Institutional capacity		VAD control becomes part of Essential Nutrition Actions (NNPSP). In 2006, UNICEF agrees to help in implementation; subsidizing cost of machinery and supply of fortificants. UNICEF organized 2007 meeting of participants from other countries as confidence- and capacity-building measures.	MoH, DNHA, MoIT, and MBS have good capacity to monitor and check quality, but no resources to implement. Planned for 2011/12. Procurement delays push fortification program to 2012/13 season.	
4.2. Requisite budgetary allocations	The micronutrient survey was part of the Demographic Health Survey and US Centers for Disease Control and Prevention–implemented survey funded by USAID and the Canadian International Development Agency.	In 2006, a 2 percent increase in price of sugar was widely accepted after fortification. 2008 study tour of DNHA, Illovo, MoIT supported by UNICEF to Zambia/Guatemala.	Resources for vitamin A fortification of sugar is supported by USAID and other donors helping CHISU (Gondwe). Cost of fortification shared by donors and government for 3 years.	
4.3. Commitment of policy champions	MoH/UNICEF continue to pursue elimination of MDD in Malawi.	UNICEF/MoH, through a consultant who is technically experienced, continue to press for sugar fortification. Government of Malawi secures commitment of donors (Irish Aid, USAID) in assisting Ilovo with equipment and fortificants.	Memorandum of understanding between Illovo and government ensures monitoring and inspection. UNICEF/MoH/DNHA continue to pursue the sugar industry. 2013: Food and Nutrition Bill drafted (AK) to provide umbrella standards and labeling guidance (AK). Mary Shawa becomes the champion of all processed food fortification and continues to push for it from Ministry of Gender, Children, Disability, and Social Welfare.	

Table C.2 Continued

Vitamin A				
				Comments and alternate hypotheses
Date/Phases:	**Pre-1996–2002**	**2003–2008**	**2009–2015**	
5. Evaluation and reform				
5.1. Changing conditions			After gazetting the government order, the sugar fortification is law. Violation is punishable under law (MBS). In November 2008, study team travels to Zambia and Guatemala.	
5.2. Changing information or beliefs of veto players and champions			Not all foods are fortified but wheat, maize, edible oil are beginning to be fortified with little or no monitoring for vitamin A. Assured support from UNICEF and other donors helps Illovo change its mind to become supportive and accepting of the fortification order.	
5.3. Available resources relative to cost			Still dependent on donor support for monitoring of fortified sugar.	

Source: Authors' compilation.

Note: MoH: Ministry of Health; DNHA: Department of Nutrition, HIV, and AIDS; UNICEF: The United Nations Children's Fund; MoIT: Ministry of Industry and Trade; MBS: Malawi Bureau of Standards; NNPSP: National Nutrition Policy and Strategic Plan; NDD: Nutrient deficiency disorders; GoM: Government of Malawi; OPC: Office of the President and the Cabinet; ECSA: East and Central Africa.; ICN: International Conference on Nutrition; IDD: Iodine Deficiency Disorder; USAID: United States Agency for International Development; WHO: World Health Organization; CHISU: Central Health Information Services Unit; MDD: Minimum Dietary Diversity; NMS: National Micronutrient Strategy

Table C.3 Iron hypothesis testing details

Iron						
						Comments and alternate hypotheses
Date:	**1990–2000**	**2001–2006**	**2006–2012**	**2012–2014**	**2015**	
Actor:	MoH					
Policy action:	Iron supplementation began. Research started on biofortification. MDD multisectoral committee formed in 1996.	Voluntary fortification of maize flour with iron. National Micronutrient Survey in 2001.	NNPSP aims at reducing anemia in pregnant women from 47 percent to 35 percent in 2012. Iron supplementation of children from standard 1–8 (CM).	Mandatory fortification of wheat flour and maize flour with iron.		
1. Agenda setting						
1.1. Focusing events	ICN1 promoted iron supplementation for pregnant women (KM). World Summit for Children (September 1990) set the goal to reduce anemia by 33 percent.	2001 National Micronutrient Survey finds 80 percent of children under 5 years are anemic (NNPSP). 44 percent of nonpregnant and 47 percent of pregnant women are anemic.	2006 study found high levels of IDA in school-aged children (CM).			
1.2. Powerful advocacy coalitions					There are plans to develop a communication strategy in collaboration with the OFSP breeders in order to better integrate biofortification into policy (RZ).	

Table C.3 Continued

Iron						
						Comments and alternate hypotheses
Date:	**1990–2000**	**2001–2006**	**2006–2012**	**2012–2014**	**2015**	
1.3. Recognized, relevant policy problem: How did this become a pressing priority for action?			Recognized problem based on 2006 study result. High levels of IDA were found in schoolchildren (CM). 2009 Multiple Indicator Cluster Survey reported high levels of IDA (AM).	Study found that Malawian diet is not sufficient to meet nutritional requirements.		
2. Design						
2.1. Pressing versus chosen problems			Pressing problem because of the results of the study	Pressing because of study findings (MoH et al. 2011)		
2.2. Ideas and beliefs	It's not clear if the women are actually taking the supplements because there were myths of supplements causing infertility (MS). Research was still being conducted to ensure that the bean breeds are accepted by consumers (RZ).			Almost most people go to hammer mills to process their maize flour. At least some part of the population is reached through commercial millers (PM).		
2.3. Cost-benefit calculations						
3. Adoption						
3.1. Propitious timing						
3.2. Veto players						

Table C.3 Continued

Iron						
						Comments and alternate hypotheses
Date:	**1990–2000**	**2001–2006**	**2006–2012**	**2012–2014**	**2015**	
3.3. Relative power of proponents versus opponents	No opponents		No opponents. National breeders were involved in the process to ensure that the government did not resist new bean varieties (RZ).	No opponents		
4. Implementation						
4.1. Institutional capacity			Institutional capacity is in place, but there is a lack of funding for procurement given withdrawal of support by World Bank.	Testing facilities are available, but it is not clear if the capacity is there to conduct more than just screening for iron.	The capacity to produce is not enough to meet the demand (RZ).	
4.2. Requisite budgetary allocations	DFID supported by procuring iron tablets (RM). However, government also procures iron supplements as part of the essential drugs package (FM).		World Bank was supporting, but this was phased out in 2010 (CM).	Funding for monitoring of all micronutrients provided by USAID.		
4.3. Commitment of policy champions	MoH continues to provide supplements and to manage distribution with support from UNICEF (FM).				Changes in personnel have made it challenging for a champion of iron bean biofortification to emerge (RZ).	

Table C.3 Continued

Iron						
						Comments and alternate hypotheses
Date:	**1990–2000**	**2001–2006**	**2006–2012**	**2012–2014**	**2015**	
5. Evaluation and reform						
5.1. Changing conditions	DFID withdrew support because of cash gate (RM).					
5.2. Changing information or beliefs of veto players and champions						
5.3. Available resources relative to cost						

Source: Authors' compilation.

Notes: Cost of hunger study showed that Malawi lost US$49,000 million in 2012 (MS). NNPSP: National Nutrition Policy and Strategic Plan; IDA: Iron Deficiency Anemia; ICN: International Conference on Nutrition; MoH: Ministry of Health; USAID: United States Agency for International Development; UNICEF: The United Nations Children's Fund; DFID: Department for International Development.

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