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Nutrition

The Nutrition Sensitivity of Agriculture and Food Policies

A Synthesis of
Eight Country Case Studies



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Table of Contents

Acknowledgements	4
Contributions.....	4
Acronyms.....	5
Executive Summary.....	6
1. The Purpose.....	12
2. Background	14
2.1 Agriculture and food systems: Importance to sustainable development.....	15
2.2 The role of agriculture in improving nutrition and diets	16
2.3 Nutrition-sensitive agriculture approaches	17
2.4 Multi-sectoral approaches to address food security and nutrition	17
2.5 Importance of governance and policies.....	18
2.6 Aligning food and agriculture policies with nutrition commitments	21
3. Methodology of the Study.....	22
3.1 The Objectives	22
3.2 Country selection	23
3.3 Data Collection.....	24
3.4 Data Analysis	26
3.5 Evaluation Tools	26
4. Characterization of the Eight Country Food Systems.....	28
4.1 The double burden of undernutrition and overweight and obesity	28
4.2 The characteristics of the food systems.....	30
5. Findings	34
5.1 Aligning agriculture and food policies.....	34
5.1.1 Country lessons incorporating the key recommendations	38
5.2 Thematic highlights of country case studies	41
5.2.1 Evidence-based interventions	41
5.2.2 Double burden of malnutrition	42
5.2.3 Women focused.....	42
5.2.4 Environment and sustainability.....	43
5.2.5 Delivery channels	45
5.3 Supporting policies and political processes.....	46
5.3.1 Capacity	46
5.3.2 Multi-sectoral coordination.....	47
5.3.3 Sustained cooperation and collaboration	49
5.3.4 District planning	50
6. Challenges and Gaps	52
6.1 Externalities: Where policies fall short	52
6.1.1 Climate variability	52
6.1.2 Increased food prices	54
6.1.3 Urban migration	54
6.1.4 Dietary shifts	54
6.2 Funding and investing	54
6.2.1 Funding policies.....	54
6.2.2 Funding Investments	55
6.3 Monitoring and evaluation	55
7. Moving Forward and Conclusions.....	58

7.1 Commitment of governments.....	58
7.2 The Lessons	59
7.3 Additional analysis needed	60
7.4 In the context of the post 2015 agenda.....	62
8. References.....	64

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The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of UNSCN or the governments they represent. The UNSCN does not guarantee the accuracy of the data included in this work.

Contributions

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Acronyms

ACF	Action Against Hunger
ADS	Agriculture Development Strategy
ANCAR	Agence Nationale de Conseil Agricole et Rural (National Agency for Rural Agricultural Counseling)
FAO	Food and Agriculture Organization
FISP	Farm Input Subsidy Program
FNSP	Food and Nutrition Security Plan
FSP	Food Security Policy
GDP	Gross Domestic Product
HANCI	Hunger and Nutrition Commitment Index
ICN2	International Conference on Nutrition
LMIC	Low and Middle Income Countries
MNI	Mainstreaming Nutrition Initiative
MSNP	Multi-sectoral Nutrition Plan
NAP	National Agriculture Plan
NCD	Non-communicable Disease
NFP	National Food Plan
NNPSP	National Nutrition Policy and Strategic Plan
PARP	Plan of Action for Poverty Reduction
PRSP	Poverty Reduction Strategic Plan
REACH	United Nations Renewed Efforts Against Child Hunger
SUN	Scaling Up Nutrition Initiative
UNDAF	United Nations Development Action Framework
UNSCN	United Nations System Standing Committee on Nutrition
WHO	World Health Organization

Executive Summary

Key Messages

- Food and nutrition security includes achieving sufficient dietary diversity and quality as well as sufficient caloric quantity.
- Food and agriculture policies and programmes have a major role to play in improving a country's nutritional outcomes.
- Many of the case studies demonstrated increased awareness of the multi-sectoral nature of nutrition and political will to address the problems of undernutrition and overweight and obesity.
- Many of the policies analyzed in the case studies incorporated nutrition objectives and indicators to measure progress, targeted the vulnerable and women, and focused on a diversified food production. However, some policies did not emphasize interventions to improve processing, storage, marketing and utilization of foods. Very few have assessed impact of their policies on nutrition outcomes.
- Major policies often include nutrition objectives, but there is a tendency to prioritize explicit sector priorities within ministries at the expense of nutrition.
- Developing increased nutrition-focused human resources capacity is a critical component of implementing multi-sectoral approaches to achieving food and nutrition security.
- Robust monitoring and evaluation and innovative monitoring tools are essential to understanding the impact and effectiveness of nutrition-focused policies and programmes.
- The rising levels of overweight and obesity, which often exist alongside undernutrition, are a challenge that must be addressed moving forward.

1. Background and Purpose

Agricultural and food systems throughout the world have evolved to become more complex and globalized. The quality of food production, processing, and consumption – as determined by the food system – is intrinsically related to the World Summit goal for all people to have the opportunity to lead a healthy and active life. Nutrition-sensitive agriculture aims to maximize the positive impact of the food system on nutrition outcomes while minimizing any unintended, negative consequences of agricultural policies and interventions for the consumer. It is placing a nutrition lens on the food and agricultural sector as a whole without detracting from the agriculture sector's own goals, which historically focus on increasing production and improving income.

The complex role of how agricultural policies can effectively address nutrition is not yet well understood. There is considerable conceptual knowledge on this topic, but little understanding of how to carry concepts and policy objectives into effective implementation and delivery of food-based approaches that impact nutritional status of populations. Policies and programmes are clearly relevant, but the tangible impact of food processing, storage, and transformation, into improvements in dietary patterns and nutritional outcomes is fragmented. Debate continues between those who argue that agricultural policy should play a large role in producing nutritious food and those who believe that it is more important for agricultural policy to focus on economic development and “feeding the planet” in the form of bulk calories. The purpose of this study is to contribute to the on-going dialogue of the gaps in our understanding of effective nutrition-sensitive agriculture and food policies and commitments, and the food-based solutions that help inform countries in their efforts to scale up nutrition.

This report presents summaries of a series of case studies that were commissioned by the UNSCN and examined the nutrition sensitivity of agriculture and food policies in eight countries, as well as how the

policies influence dietary, nutritional and health outcomes. The eight countries studied include Brazil, Malawi, Mozambique, Nepal, Senegal, Sierra Leone, South Africa, and Thailand. The major objectives were as follows:

1. Identify and describe food and agriculture strategies, policies, and investments that incorporate nutrition-sensitive actions and recommendations.
2. Describe policy processes and the political environment of nutrition-sensitive food and agriculture policymaking and identify factors contributing or impeding collaboration and cooperation between relevant ministries.

Data collection and analysis included secondary data analysis, review of policies, in-country consultations, stakeholder focus groups and interviews. Food and agriculture policy documents (n=73), were scored against the key recommendations on agriculture programming for nutrition¹. In depth interviews were conducted with 165 national stakeholders in national agriculture and nutrition programming in the countries and questionnaires were administered to 31. Specific thematic areas were assigned to each country's study. These included engagement with the broader food supply chain; the food, agricultural, and trade policies of the country; and the potential link of these policies to nutrition and health outcomes in the country. More detailed specifications and analysis frameworks were elaborated with a group of experts during the UNSCN [Meeting of the Minds](#)² in Geneva in early 2013. During this meeting, there was agreement on the common methodological approach for the case studies, a detailed framework of analysis, and a list of research questions to be answered.

2. Findings

Most of the country case studies performed a qualitative assessment on the food, agriculture, and nutrition policies and plans using the Key Recommendations for Improving Nutrition through Agriculture (Herforth and Dufour 2014) for improving nutrition through agriculture. These country cases assessed the degree to which each policy or plan followed the recommendations. Many of the policies incorporate nutrition objectives, goals and indicators in their strategies, however translating these into programmes and practice is another reality. Almost all of the policies focus on increasing food production, which is the mainstay of modern agriculture. Throughout most of the policies there is also an emphasis on women-led and -engaged agriculture. Bolstering the engagement of women on an economic and developmental level within agriculture is increasingly recognized as an important investment for countries, and targeting women has strong evidence for improving nutrition outcomes at the household level. Some countries' policies did not emphasize post harvest storage; processing and attainment of nutritional quality of commodities and nutrition-sensitive value chains are not well framed.

The contexts of the eight countries are very different and yet common patterns across the studies demonstrate underlying dynamics that fundamentally link nutrition to agriculture. Strong government commitment to improving nutrition outcomes is a crucial first step, and all of the countries studied demonstrate this commitment to some degree. However, efficient systems, institutional capacity, incentives for multi-sectoral collaboration and dialogue, and monitoring and evaluation systems are the mechanisms through which these commitments can be realized. We are just beginning to understand the concrete factors that link agriculture and nutrition within these mechanisms. It is clear that better capacity and understanding would benefit every country studied. Governments that achieve significant gains in nutritional outcomes through improving agricultural policies and programs will be at the vanguard of a

¹ <http://www.fao.org/docrep/017/aq194e/aq194e00.htm>

² http://www.unscn.org/en/sessions/unscn_meetings_2013/

new methodology and have the opportunity to significantly contribute to learning in this area. These countries have already demonstrated valuable lessons, both in terms of successes and opportunities.

Nutrition is often considered an institutional orphan that does not fit neatly into the defined scope of work of any one ministry. Many of the policies and programmes analysed address pieces of the nutrition challenge, but the policymaking structure has been traditionally isolated within distinct ministries under the assumption that their goals are sector-specific. Nutrition is a complex, multi-sectoral challenge and current policy responses do not necessarily reflect those complexities.

The eight countries demonstrated that there is a tendency to prioritize more explicit sector priorities among ministries at the expense of nutrition objectives. Many of the food and nutrition security policies analysed incorporate agricultural objectives, but this was not generally reciprocated. Most of the agricultural policies focus primarily on economic productivity (through increased production of cash crops) and poverty alleviation (through sale of agricultural products) and lack explicit nutrition-focused objectives. A concerted effort should be made to ensure that nutrition is a defined priority and responsibility of the agriculture sector, and ultimately the health and education sectors as well.

Among the countries analysed, challenges related to fostering a “supportive environment” were among the most pervasive barriers to achieving positive nutrition outcomes. Most of the agriculture policies analysed concentrate on increasing production of cash crops and economic growth. These priorities do not naturally coexist with those of nutrition-sensitive agriculture, such as increasing production of foods, improving food processing and storage to retain nutritional value, and targeting populations that are vulnerable to malnutrition.

The lack of expertise and coordination between ministries is another challenge to achieving a supportive environment in the countries, with perhaps the exception of Brazil and Thailand. Effective nutrition-sensitive agriculture requires expertise not only in nutrition, but also in food systems, agricultural production, enterprise, community engagement, and health. Many of the countries’ key stakeholders recognized that there are few to no agricultural policy-makers or programme personnel who also have expertise in health and nutrition, nor do they include or appoint experts during policy development. The objectives of nutrition, agriculture and health are intrinsically related and often mutually reinforcing. A clear understanding of those relationships among policymakers, achieved through improved education in nutrition-sensitive approaches and a mutual language for engagement, can break down many of the barriers to collaboration. The multi-sectoral nature of nutrition provides an opportunity to be innovative in policy approaches and incentives. For example, given the importance of proper nutrition on the economic productivity of the population, there is a strong economic justification for using fiscal, trade, and regulatory instruments to support the production and consumption of nutritious foods.

Finally, effective monitoring and evaluation systems are essential for policymakers to achieve substantive gains in nutrition-sensitive agriculture. Each of the major food and agriculture policies had some issue with their monitoring and evaluation Frameworks. Some of the issues are due to a lack of evidence that still exists between agriculture, nutrition and health, so collection of objective data is key. Clear and defined metrics should be developed to guide operational programmes in agriculture and health toward common goals, and governments should measure and evaluate the contributions of agriculture and food to diet and health. Rigorous monitoring and evaluation systems will equip policymakers to be targeted and data-driven in their response to nutrition challenges and facilitate a more productive dialogue among relevant stakeholders. In addition, the growing ubiquity of real-time data collection allows for rapid assessment of implementation needs, advancing the conversation about the challenges, successes, and lessons learned in implementation and impact of nutrition-sensitive agriculture interventions.

3. Conclusions and Recommendations

The relationship between nutrition outcomes and broader agriculture and food systems is undeniable, as is its potential to combat hunger and malnutrition. It is clear that the policy priorities for agriculture should include explicit nutrition objectives. What remains unclear is the best path for translating policy into effective programmatic action to achieve the desired impact. More analysis is needed specifically around:

- The challenges of operationalising nutrition-sensitive agriculture policies;
- Identifying metrics that effectively measure and evaluate the contributions of agriculture to diets and health, and provide feedback to policies and programmes;
- Assessing gaps in skills and required competencies, and making plans to close those gaps; and
- Understanding long-term implications of nutrition-sensitive agriculture in the context of the increasing global pressures of population growth, urbanisation, and climate variability.

Operationalising policies require a new way of working. Ministries must create systems to engage in policy dialogue about nutrition, allocate sufficient funding for sector-specific nutrition activities and hold themselves accountable for achieving positive nutrition outcomes. Donors should be a part of that collaborative process, facilitating cross-sectoral planning and implementation of nutrition-sensitive agriculture activities. Clear implementation plans are challenging, even when there is collaborative, inter-ministerial effort and policies are well structured and coherent.

Many of the countries studied have taken steps to include nutrition within other ministries' policies, but they have yet to monitor the operational progress at a national, centralised level. As countries begin to implement programs, they will have the opportunity to undertake analysis at the baseline that will elucidate the factors that hinder and/or advance implementation and best practices for mitigating any challenges. The inclusion of concrete and robust metrics will help assess process, impact, and relevant externalities. Thus far, no consensus has been reached on what a comprehensive set of indicators should look like. There have been a few proposed indicators, but they do not fully capture a holistic and nuanced view of nutrition-sensitive agriculture and its impacts. The full set of indicators must include specific vulnerable populations, such as women; the relative effect of policies on both undernutrition and overweight and obesity status; the geographic distribution of impact, particularly between rural and urban populations; the macroeconomic impacts of such policies, particularly on food prices and trade; and the effect on a range of environmental factors and vulnerability to severe climate events on sustainable diets. It will be essential to create a set of widely accepted and applicable metrics and figure out how to effectively collect them.

There are also a number of externalities and components that "we don't know what we don't know" with respect to nutrition-sensitive agriculture. External drivers such as climate variability, food price volatility, and urban migration will have less predictable effects on food and nutrition security and complicate efforts to develop nutrition-sensitive policies and programmes. Researchers and policy makers can use effective metrics and systems for monitoring to identify and be responsive to these unknown or unintended outcomes and consequently advance the dialogue about what works in nutrition-sensitive agriculture.

Implementation of nutrition-sensitive agriculture also relies on a workforce educated in the relevant skills and understanding the competencies required to carry out a multi-sectoral plan. As discussed, there is a lack of expertise in nutrition in most countries included in the analysis and even fewer people with substantive cross-sectoral knowledge. An effective implementation plan must include a human resources strategy to assess the existing skill gap and to build the required expertise. Best practices should be further analysed to assess the human resource structures of successful (and unsuccessful) projects across relevant ministries.

Even the most effective nutrition-sensitive agriculture strategies analysed in this report are in nascent stages of implementation and resulting impact. The baseline period of these projects is the opportune time to establish long-term research and monitoring of nutrition-sensitive agriculture.

Demographic and environmental shifts will play a large role in food systems, deeply affecting patterns of production and consumption of nutritious foods. The pressures of population growth, urban migration, and environmental risk and climate volatility, as well as the movement of ideas and technology freely across borders in an increasingly globalized planet will all play a role in those production and consumption patterns. The international community needs to collectively endeavor to understand the resulting impact on nutrition outcomes. Policies need a longer-term horizon that internalises these shifts, as well as the monitoring systems and metrics to interpret the long-term effects and changes.

It is also unclear how middle-income countries — including Brazil, South Africa and Thailand — will effectively address the dietary and nutrition transition that is increasing the overweight and obesity burden and risk of non-communicable disease. This remains a central unresolved issue for all countries. Globalisation, trade, food industry, and urbanisation will only become more intertwined with each other and with food systems across countries, regions and the globe. It is unclear how to mitigate the “globesity” trend of increasing overweight and obesity through the food and agriculture sector. Very few countries at the moment have effectively tackled this issue.



Mozambique. Credit: Jess Fanzo

4. In the Context of the Post 2015 Agenda

We are rapidly approaching 2015 and the shift to a post-2015 agenda. The Millennium Development Goals (MDGs) have brought much-needed attention to a number of priority areas in sustainable development policy, but the experience of the MDGs has also highlighted a number of shortcomings and gaps in their coverage. While food security was prioritised by the MDGs, efforts for achieving food security have been overwhelmingly characterised by agriculture-driven interventions that focus on increasing caloric intake through increased food production, primarily of staple foods.

Food security will deservedly be a major focus of the post-2015 agenda, and with the experience of the MDGs, it has become clear that nutrition must be central to the post-2015 goals and the strategies put forward to achieve food security. This will require countries to position nutrition objectives explicitly within their broader agriculture agenda. The latest series on nutrition in the Lancet journal³ emphasised chronic undernutrition (also called stunting which leads to not achieving full genetic potential in cognitive and immune development) over acute undernutrition (also called wasting or starvation). It is particularly relevant for changing agricultural systems to meet not only caloric needs, but also the micronutrient and quality needs of populations.

All of the country case studies demonstrated that there is some level of commitment to achieving positive nutrition outcomes, as well as an understanding, to varying degrees, that the agricultural sector has a pivotal role in achieving nutrition objectives. As we move forward into the post-2015 era, good practices and transferable lessons can be drawn from each country case study. The studies collectively highlight the importance of a supportive policy environment, well-developed human resources, and effective systems for planning, implementation, and monitoring impact for creating successful, nutrition-sensitive agriculture policies and programmes.

³ <http://www.thelancet.com/series/maternal-and-child-nutrition>

1. The Purpose



Malawi Credit: Jess Fanzo

The agriculture and food system is ideally situated to influence the production and consumption of the nutritious foods needed for a healthy and active life. Present agricultural and food systems have become more complex and increasingly global, with longer supply chains from farm to fork. *Nutrition-sensitive* agriculture aims to maximize the impact of the agriculture and food system on nutrition outcomes, while minimizing the unintended consequences of agricultural policies and interventions on the nutrition level of the consumer. It is placing a nutrition lens on the food and agricultural sector as a whole, without detracting from the sectors own goals, which generally emphasize increased production and improved income (Herforth et al 2012).

We do not yet fully understand the impact of agricultural policies on food consumption and nutrition outcomes. There is conceptual knowledge on this topic, but little understanding of how to carry these concepts into effective programme implementation. Debate continues between those who suggest that agricultural policy should play a large role in producing nutritious food and those who believe that it is more important for agricultural policy to focus on “feeding” the planet and economic development by increasing production, especially that of cash crops (Nugent 2011).

A number of countries have started to link their national agriculture and food policies to specific nutrition objectives in an effort to address the burden of malnutrition, which can shape a country’s development. These countries address the multiple underlying causes of malnutrition in broad areas such as agriculture, food security, and food supply, as well as at different stages along the value chain. Even more innovative and powerful solutions come from addressing nutrition outcomes through multidisciplinary efforts,

including ministries of women, economic growth, water and sanitation, planning and development, and others. Some of the countries are at a very early stage, whereas others have progressed further, linking nutrition objectives to agriculture policies.

This synthesis report provides an analysis of eight country case studies that summarized the inclusion of nutrition in the agriculture and food policies of each country. Specifically, we asked how nutrition-sensitive these national policies are and if there is any evidence as to how they influence dietary, nutritional, and health outcomes. The countries included in the analysis are Brazil, Malawi, Mozambique, Nepal, Senegal, Sierra Leone, South Africa, and Thailand.

These country cases can contribute to a better understanding of how countries are defining their own food and agriculture policies in terms of nutrition sensitivity. This synthesis report has been developed in preparation for the International Conference on Nutrition (ICN2) in 2014. It uses data in existing databases or country profiles (e.g. the Nutrition Landscape Information System by the World Health Organization (WHO) or Country profiles and FAO Stat by the Food and Agriculture Organization (FAO) as well as the World Bank and United Nations Development Program).

2. Background



Thailand Credit: Jess Fanzo

As we rapidly approach the 2015 mark of the Millennium Development Goals, the World Summit goal for all people to have the opportunity to lead a healthy and active life with access to enough nutritious food has yet to be achieved. The goal has been reiterated time and time again, with every confidence that reaching this goal is realistic. The MDGs prioritized food security and sustainable development for the ultimate goal of poverty alleviation. Efforts to achieve food security have been overwhelmingly characterized by agricultural interventions that focus on increased food production and economic development. This focus has highlighted a number of shortcomings and gaps in coverage, particularly where increased economic status does not concomitantly reduce the rates of food insecurity or malnutrition. Hence, food security will deservedly remain a major focus of the post-2015 agenda, but the importance of improving nutrition will also be central to achieving the overall goals. This will require countries to position nutrition objectives explicitly within their broader agriculture agenda.

Historically, malnutrition is thought of broadly as a lack of sufficient food. However, in light of rapidly changing economic landscapes in and between nations, there are multiple ‘burdens of malnutrition’ that contribute to poor health and development. Children who do not consume adequate calories and micronutrients over long periods (beginning in utero) do not achieve full genetic potential in cognitive, reproductive and immune development. The latest series on nutrition in the *Lancet* journal⁴ emphasized chronic malnutrition over acute malnutrition in terms of the overall detrimental effect on society. Micronutrient deficiencies of essential vitamins and minerals (such as iron, zinc, folic acid, vitamin A, etc.) are also gaining importance as the scientific community proves links to disease and inhibited development. It is critical for changing agricultural systems to meet not only caloric needs, but also the micronutrient and quality needs of populations.

⁴ <http://www.thelancet.com/series/maternal-and-child-nutrition>

The global prevalence of chronic malnutrition, also called stunting, has declined 35% since 1990 (a reduction of 2.1% per year). Yet there are still an estimated 162 million children globally who are stunted (Black et al 2013; UNICEF 2013). Some of the countries in this analysis, such as Malawi and Nepal, contribute to these high numbers. On the other end of the malnutrition spectrum, an estimated 43 million children under five years of age are overweight, and two-thirds of those children reside in low- and middle-income countries (Black et al 2013; UNICEF 2013).

The prevalence of undernutrition in adult women has decreased in Africa and Asia in the last four decades, but still remains above 10% in the two regions. At the same time, prevalence of overweight and obesity in adult women has increased in all regions (Black et al 2013). Micronutrient deficiencies of essential vitamins and minerals continue to be widespread and have significant adverse effects on infant and child survival and development, as well as maternal health.

Many countries are now seeing high rates of stunting and micronutrient deficiencies at the same time as increasing rates of overweight and obesity. This 'double burden of malnutrition' is exacerbated by large income and wealth disparities within nations. These nations are experiencing the 'nutrition transition'. This transition involves a change in dietary consumption with increased intake of highly refined, energy dense foods and a concurrent decrease in energy expenditure due to a more sedentary lifestyle. This transition often coincides with economic, demographic and epidemiological changes within a country. Communities and households undergoing this transition move from states of food shortage to states of being nourished with energy-dense foods that can increase risk of overweight and obesity and non-communicable diseases. The trajectory of transitional nations suggests that the burden of overweight and obesity will eventually outweigh undernutrition in tandem with economic growth (Popkin et al 2012).

2.1 Agriculture and food systems: Importance to sustainable development

Extensive research of global trends has demonstrated that growth in the agricultural and food sector is at least two to three times more effective in reducing poverty than the same degree of growth in the non-agricultural sector (Diao et al 2012). In many low- and middle-income countries, agriculture can make a significant contribution to the national gross domestic product (GDP) while also providing employment opportunities. Improvement and growth in the agriculture industry is imperative to combating poverty, hunger, and undernutrition (FAO 2012; FAO 2013a,b). Sustainable agricultural growth is often effective in reaching the poor because most of the poor and undernourished live in rural areas and depend on agriculture for a significant part of their livelihoods. However, because agricultural growth is often focused on increased production of staple foods that are low in nutrients and other cash crops, agricultural growth does not necessarily result in better nutrition. Strategies that ensure nutrition-sensitive growth include supporting increased dietary diversity and quality; improving access to safe drinking water, sanitation, and health services; and educating consumers on adequate nutrition and child care practices.

Forms of Malnutrition and their Anthropometric indicators

Chronic malnutrition is caused in part by long-term inadequate nutritional intake and poverty. Chronic malnutrition can lead to impaired physical and cognitive development, with lifelong repercussions. **Stunting** occurs when an individual's height for age is below minus two standard deviations from the median of the WHO Child Growth Standards.

Acute malnutrition is caused by inadequate caloric intake and disease burden. Acute malnutrition is measured by comparing weight for height. **Wasting** occurs when an individual's weight for height is below minus two standard deviations from the median of the WHO Child Growth Standards.

Overweight occurs when an individual's weight for height is more than two standard deviations above the median of the WHO Child Growth Standards. **Obesity** occurs at three or more standard deviations above the median.

2.2 The role of agriculture in improving nutrition and diets

"To overcome the dual challenges of under and imbalanced nutrition requires a diversified diet made up of safe, sufficient and nutritious food over the lifecycle, especially for women of reproductive age and children" (HLC 2013).

There has never been a better time to examine how agriculture and our global food system can address nutrition and improve diets. Agriculture is critically important to nutrition because agriculture's primary role is to produce food for human consumption. This makes it a clear contributor to nutrition and health (Dangour et al 2012).

While the benefits of the globalized food system are apparent—greater choice for consumers, greater nutritional diversity, and lower cost—the risks are increasingly apparent as well. The present system should be credited with making food more widely available and affordable to large portions of the world. Yet recent trends in food production, processing, trade, marketing, and retailing contribute to the rising occurrence of diet-related non-communicable diseases around the world. – Nugent 2011

The most undernourished populations live in rural areas, where agriculture is a vital activity that provides food for household consumption and serves as the primary source of income. Seventy-five percent of the world's poor are rural (World Bank, 2012). These people are the most dependent on local agriculture for their food security and nutritional needs, and therefore are the most vulnerable to food shortages and shocks. Given the high level of dependency of many of the world's poor and nutritionally vulnerable on agriculture as their primary source of livelihood, a major role of the food and agriculture sector should be to improve household food security and alleviate and prevent malnutrition (Herforth et al 2012; World Bank 2012). However, increased productivity is often considered the main objective for the agriculture sector. The current global agricultural system is producing enough food to feed the world, in aggregate, but is not providing all people with access to enough affordable and nutritious food.

"Food security exists when all people at all times have physical, social, and economic access to food, which is safe and consumed in sufficient quantity and quality to meet their dietary needs and food preferences, and is supported by an environment of adequate sanitation, health services and care, allowing for a healthy and active life." (WFS 1996)

Food and nutrition security: While the broad definition of food security embodies key determinants of good nutrition, the term "food and nutrition security" has been used as a way to combine the two concepts of food security and nutrition security. This term is most commonly used in the socio-economic and the food and agricultural communities in recognition of the traditional emphasis on the availability, access, and stability dimensions of food security. In addition, it acknowledges that food security actions should ensure that food systems provide all households with stable access to sufficient, appropriate, and safe food, while nutrition-oriented action should ensure that households and individuals have the knowledge and supportive health and environmental conditions necessary to obtain adequate nutritional benefit from the food (CFS 2012).

There is a renewed global focus on developing interventions that address the root causes of food and nutrition security (both undernutrition and overweight and obesity), especially because of new tools and knowledge that are now at our disposal. These interventions are often devised as multi-disciplinary approaches to malnutrition, and should include agriculture. Although the underlying determinants of malnutrition have been well understood for decades, the design, testing, and scaling of more holistic, multi-sectoral packages have been limited in their development and implementation. The few packages already developed generally combine child and maternal care and disease control with nutrition-sensitive

and agriculture-focused approaches, which are rolled out through the food/security and livelihoods channels. This trend demonstrates that the food security sector reaches across to agriculture much more than the mainstream agricultural system incorporates nutrition objectives. There have been many recent scientific publications, policy documents, and reports examining the role of agriculture in improving nutrition, but clear policy and programmatic recommendations are still lacking overall.

2.3 Nutrition-sensitive agriculture approaches

Nutrition-sensitive approaches address the underlying determinants of malnutrition and child development, including poverty, food insecurity, and lack of access to adequate health, water, and sanitation services by engaging complementary sectors, such as agriculture, health, social protection, early child development, education, water and sanitation, and women's affairs. These approaches can be implemented on a large scale and should target to those most vulnerable to malnutrition. They should also focus on prevention, complement curative approaches needed to address malnutrition, and serve as delivery platforms for nutrition-specific interventions (Ruel et al 2013). Although it is well understood that involving these sectors is critical to addressing the many facets of malnutrition, more evidence and understanding of how to carry out multi-sectoral nutrition-sensitive approaches is needed.

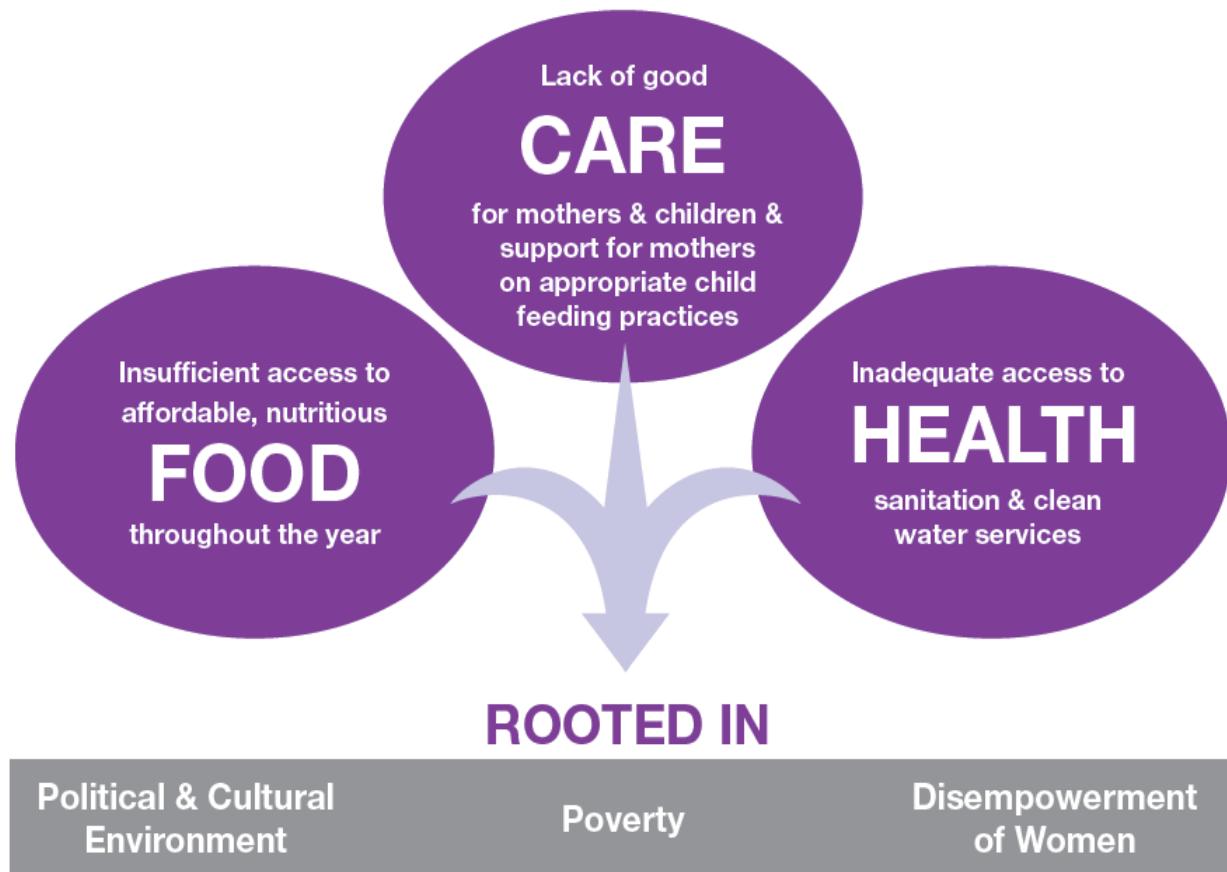
Nutrition-sensitive agriculture involves the design and implementation of nutrition-based approaches to sustainable farming and cropping systems. Ultimately, nutrition-sensitive agriculture is aimed at improving the nutritional outcome of a population by maximizing the positive impact of food and agricultural systems on nutrition while minimizing the potential for negative externalities on the sector's economic and production-driven goals. It is agriculture with a nutrition *lens* and should not detract from the sector or consumer goals (Herforth et al 2012; FAO 2013b).

Nutrition-sensitive agriculture should focus on the entire human lifecycle and should consider the nutrients and determinants that are important for development, growth, and maintenance of health at different stages of life. The approach should encompass the entire food system – a complete array of activities covering all stages of the food supply chain ranging from input distribution, on-farm production, marketing, processing, and storage. The goal should be to produce healthy and safe food containing essential micronutrients and to increase year-round, affordable access for both rural and urban populations.

2.4 Multi-sectoral approaches to address food security and nutrition

Leveraging agriculture to achieve improved nutrition outcomes is part of a larger conceptual framework, which holistically engages multiple sectors and disciplines to address both short and long-term determinants of malnutrition. Malnutrition has a complex causal framework, which includes underlying determinants, such as food systems and health and care systems, as well as more basic structural determinants, such as governance, policy frameworks, economic growth, and existing social and legal structures (UNICEF 1990) (**Figure 1**). The complex interaction of these factors highlights the need for an interdisciplinary response, which integrates technical interventions across sectors to address the root causes of food insecurity and malnutrition. This approach requires the insight and programmatic support of the agriculture, public health, water and sanitation, women's empowerment, education, social protection, and infrastructure sectors (World Bank 2006; World Bank 2012).

Figure 1: Causal Framework of Undernutrition (UNICEF 1990; Adapted by DSM 2013)



Policies supported by these sectors can play both primary and secondary roles. Food and agriculture policies are clearly a central component. Environmental, water, and education policies that have nutrition-sensitive approaches and investments can also play an indirect yet important role in improving nutrition. This approach would inherently build on the knowledge and capacities of local communities to transform and improve the quality of diets to achieve better child health and nutrition (World Bank 2012).

A study by Levinson and Balarajan (2013) examined multi-sectoral approaches to improving nutrition outcomes in Peru, Brazil, and Bangladesh, and found that their convergence is poorly understood. The authors suggested that results-based incentives for sub-national governmental bodies with elected officials could encourage more proactive accountability for reducing malnutrition. They also suggested that engaged advocacy is necessary to ensure sustained commitment (Levinson and Balarajan 2013). The agriculture sector has committed to nutrition – most recently through the reform of the Committee on World Food Security (CFS) – the most inclusive international and intergovernmental platform that works towards the achievement of food security and nutrition for all (CFS 2013).

2.5 Importance of governance and policies

Nutrition has been somewhat of an ‘institutional orphan’ in the past. It was “everybody’s problem and no one’s main responsibility” (Pridmore and Carr-Hill, 2009; Morris et al 2008). However, nutrition has

recently enjoyed unprecedented momentum and has become a leading priority in the international development agenda. The change in global sentiment toward improving nutrition is due in part to high-level policy campaigns such as the Scaling Up Nutrition (SUN) and the 1,000 Days Initiative (Colnar et al 2012; UNICEF 2013).

Definition of Policy and Action Plan

A policy is a written statement of commitment (generally in broad terms) by a nation state. A strategy may be similar to a policy. An action plan arises from a policy; it contains detailed operational plans, including budgets, and goals and targets that are specific, measurable, attainable, relevant and time-bound (WHO 2013).

In 2008, the Centre for Global Development's "Review of the Global Nutrition Landscape" cited the need to completely overhaul the nutrition system and its placement on the policy agenda (Levine and Kuczynski, 2008). Historically, even in the context of economic growth, nutrition policies and commitments have not been empirically linked to a reduction in malnutrition (Harriss and Kohli, 2009). Though the need for overarching public health governance was well understood long ago, the application of these lessons to nutrition has lagged considerably due largely to the difficulties in creating a space for nutrition in the international development agenda (Levine and Kuczynski, 2008) as well as within food and agriculture policies and plans.

Both the 2008 and 2013 *Lancet* series on under-nutrition identified several country-level limitations of nutrition policies in the absence of an effective governing strategy (Bryce et al 2008; Gillespie et al 2013). The bottlenecks produced by inefficient governance identified by the series in 2008 include: failure to build and maintain priority for nutrition, choosing interventions without science-based evidence of improved nutritional status, poor targeting, challenges for achieving scale for policies and programmes, and the need to improve the operational and strategic capacity of those policies and programmes (Bryce et al 2008). Gillespie et al (2013) reiterated that progress in reducing malnutrition cannot be sustained where governance systems are weak or absent, and that strong leadership in the form of champions who advocate for the political cause can facilitate inter-sectoral action to improve nutrition. However, capacity, commitment, accountability, and responsiveness are critically important at all levels, not just the policy level. Many of these factors have been lacking or remain unclear in their application to other sectors, such as agriculture towards nutrition.

In 2009, the WHO landscape analysis examined a series of countries with high stunting rates and governments with the capacity and readiness to produce decisive changes. The indicators of capacity and readiness included measures of nutrition-related legislation - including prioritization - (as part of Poverty Reduction Strategies and/or UN Development Assistance Frameworks) as well as public health expenditure (percentage of government expenditure for health). Other indicators included the existence of a national nutrition plan and its budget, existence of budget lines for nutrition in health budgets, and the existence of nutrition surveillance (Mejia Acosta and Fanzo 2012; Haddad et al 2012). The readiness in the agriculture sector to take on nutrition interventions was not taken into account.

The proposed nutrition governance score demonstrated that there is little correlation between countries' commitment to nutrition and their progress towards improving nutrition and food security (WHO 2009). The Hunger and Nutrition Commitment Index⁵ (HANCI) provides scores on the ability of countries to commit to reducing hunger and undernutrition, using several indices that capture different aspects of

⁵ For more information, visit www.hancindex.org

governance and the political climate (HANCI 2013). The HANCI ranks country commitment to reducing hunger and undernutrition. However, there is no score for nutrition-sensitive agriculture commitments. The Key Recommendations for Improving Nutrition through Agriculture (FAO 2013b; Herforth and Dufour 2014) may be an opportunity for HANCI to internalize some type of nutrition-sensitive agriculture measurement in their overall index.

Action Against Hunger (2010) completed an assessment of nutrition policies in five countries – Bangladesh, Brazil, Malawi, Mozambique and Peru – all of which have significantly reduced undernutrition rates over the last 15 years. Among the successes identified and recommendations made, the assessment highlighted a) the importance of favoring a multi-sectoral approach; b) making and maintaining nutrition as a main political priority; c) engaging the civil society in both ownership and ongoing participation; d) adopting a multi-phase approach that includes short and long-term interventions; e) institutionalizing a central coordinating council that has political support; and f) continuing financial support and investment. The assessment provided case study evidence of what is currently working in those countries, though no systematized analysis of the role of governance was offered.

The Mainstreaming Nutrition Initiative (MNI) gathered evidence on factors that help and hinder the movement of nutrition agendas at the country level in Bangladesh, Bolivia, Guatemala, Peru, Pakistan, Vietnam, Uganda, and Ethiopia (Pelletier et al 2011). A study done by Mejia Acosta and Fanzo found that ongoing government efforts to reduce malnutrition are more likely to produce development outcomes when proposed policy changes are effectively aligned with the political motivations of government and non-government policymakers (Mejia Acosta and Fanzo 2012; Haddad et al 2012). While examining the political structures and governance challenges with scaling up nutrition, these studies did not provide recommendations on how the “other” major sector, agriculture, can effectively address undernutrition.

Two recent nutrition policy analyses were done that are relevant to this work. The WHO (2013) published a global nutrition policy review, which provided information on 1) whether the countries have nutrition policies and programmes, 2) how they are being implemented, 3) the implementation coverage, 4) who the stakeholders are, 5) what the coordination mechanism is, and 6) how monitoring and evaluation are being implemented. Although they acknowledged that progress has been made in the design and implementation of policies and programmes, they also identified gaps in the design, content and implementation (WHO 2013). A similar work on agriculture policies does not yet exist. ACF also did a recent review of nutrition policies focusing on three countries: Burkina Faso, Kenya and Peru. Their major recommendations were to give nutrition-sensitive actions higher priority in order to leverage and accelerate implementation efforts of policies. They also suggested incorporating consumption indicators into agriculture information systems, strengthening coordination for nutrition, ensuring agriculturalists receive nutrition training, and increasing funding to support the implementation of nutrition-sensitive agricultural approaches (ACF 2013). These recommendations are parallel to those from this study.

2.6 Aligning food and agriculture policies with nutrition commitments

Jaenicke and Virchow (2013) outlined five crucial entry points to improve nutrition-sensitive agriculture approaches. They highlighted two entry points in particular: a) enabling policies and government structures expressing the political will to fight malnutrition and micronutrient deficiencies and b) appropriate mechanisms for inter-sectoral and inter-organizational collaboration within the countries. Many studies and country cases have shown that for nutrition-sensitive agriculture programmes to be successful, partners from different sectors must be considered as active players.

Policies and processes of global market integration can influence long-term dietary change, but there is a need to look beyond the health sector (Hawkes 2006). Policies also need to focus on the promotion of healthy, high-quality diets over the long-term among populations living in lower income countries. Hawkes noted that there were few comprehensive sets of policies addressing obesity and diet-related chronic diseases in the developing world. This remains true today. There is also very little that existing policies do to address the forces and institutions of the global marketplace that can have more detrimental effects to the health of populations (Hawkes 2006; Verstraeten et al 2012).

"Where policies exist that support nutrition-sensitive approaches and where active government processes stimulate joint agriculture nutrition approaches, there is a relatively high likelihood of success in implementing such programmes and projects with the theoretical implication of improved, nutrient-rich and balanced diets, and eventually, improved health status of consumers. However, the sustainability of such initiatives relies heavily on sustained political will."

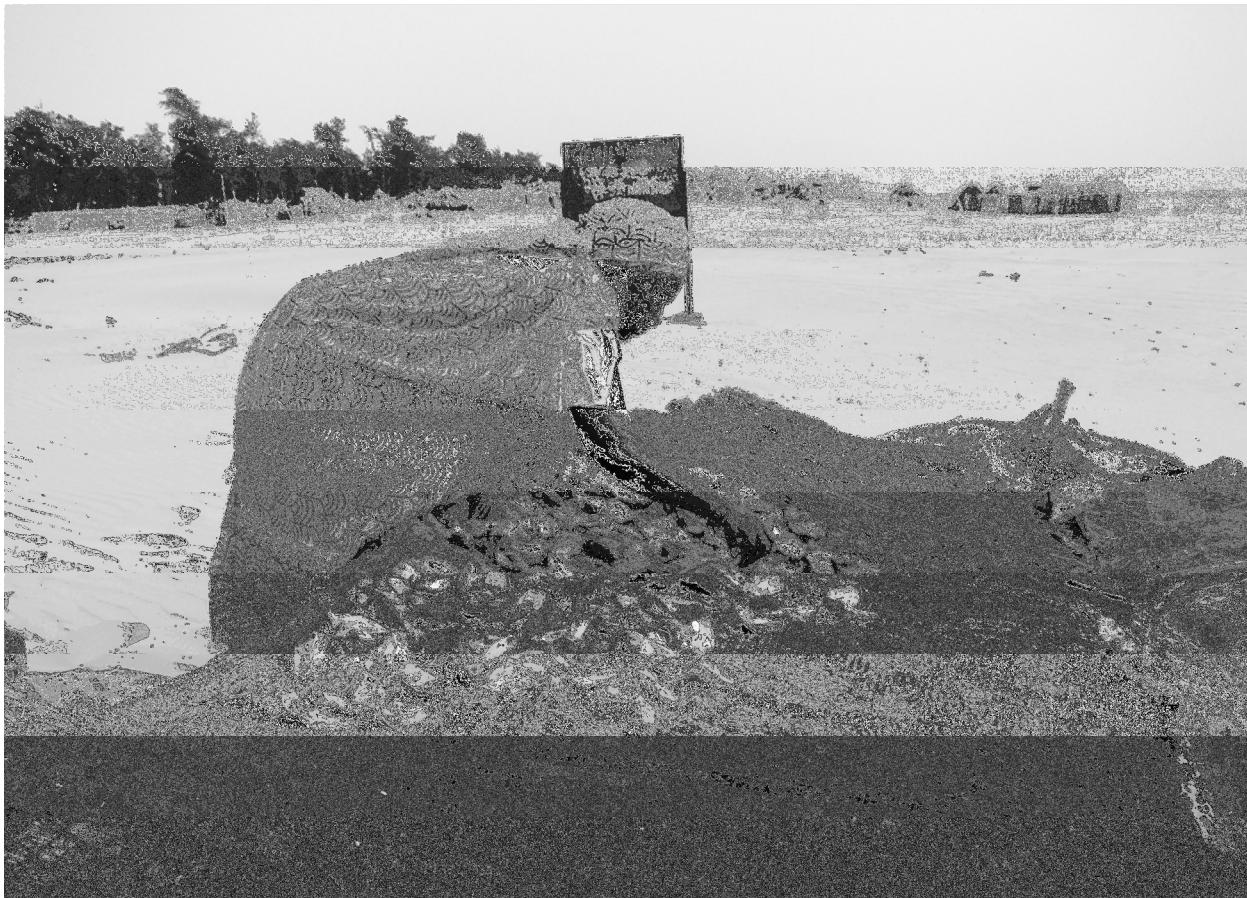
- Jaenicke and Virchow 2013

Since WHO's Global Strategy was adopted in 2004, governments are increasingly beginning to implement food policies to encourage healthier eating. Although the main approach has been to provide information for consumers, countries have made notable steps in reformulating food products, establishing school food standards, nutrition labeling, restricting food marketing to children, promoting fruits and vegetables, and more recently, implementation of food taxes. However, when it comes to national food and agricultural policies, the focus remains mainly on producers. The policies are also not designed with public health in mind. For example, the relationship between population nutrition and chronic disease risk is often ignored in most agriculture policies (Nugent 2004). This was corroborated by other analyses. An analysis undertaken by Wang and Lobstein points out that current food policies are largely incompatible with good public health, but interventions that include food producers, processors, and food providers can markedly improve a population's dietary health. Such an improvement would require cooperation between farming and commercial food producers in order to counter the current trends in food supplies and to re-shape the nutrition transition (Wang and Lobstein 2003).

Agriculture Investments: Aligned with Nutrition?

In the WHO nutrition policy review (WHO 2013), the most commonly reported policy activities in food security and agriculture were research (59%) and provision of seeds (55%), subsidized sales and construction of irrigation systems (48%), construction of rural infrastructure (42%), price control (41%), international agreements to increase domestic food production (41%), production credit from state-owned banks (39%) and subsidized food for vulnerable groups (38%). The main policy goals of these programmes were to increase output and farm incomes, followed by improving quality of the products. Few of the broad policy goals explicitly mentioned nutritional goals, such as combating undernutrition, reducing overweight or obesity, or promoting a healthy diet.

3. Methodology of the Study



Senegal Credit: Kyu Lee

3.1 The Objectives

This paper summarizes a series of eight country case studies that examined the nutrition sensitivity of agriculture and food policies and their influence on dietary, nutritional and health outcomes in eight countries. The eight countries studied were Brazil, Malawi, Mozambique, Nepal, Senegal, Sierra Leone, South Africa, and Thailand and detailed reports will be published by SCN (**Figure 2**). The studies were conducted to advance the debate on nutrition-sensitive agriculture by providing a descriptive review of current food and agricultural policies. The goal is that these country cases will contribute to the nutrition-agriculture dialogue by providing answers to some emerging questions on:

- What is the specific nature and range of agriculture and food policies?
- How are these policies aimed to improve nutrition for various populations and geographies?
- At what critical points do the nutrition policies and interventions engage with the food and agricultural system (how and through what actors and institutions)?
- What known or potential effects result from these policies?
- How do monitoring and evaluation systems assess the impact of food and agriculture on nutrition and what current metrics are available?
- What were the key knowledge gaps in the relationship between the shape and operation of the food and agricultural system and nutrition?

The major objectives of the 8 country case studies were as follows:

- (i) Identify and describe food and agriculture strategies, policies, and investments that incorporate nutrition sensitive actions and recommendations.
- (ii) Describe policy processes and the political environment of nutrition sensitive food and agriculture policymaking and identify factors contributing or impeding collaboration and cooperation between relevant ministries.

3.2 Country selection

Some criteria were established as part of the country selection. First, Agriculture is an economic driver in all eight countries, and all countries selected have the potential to improve agriculture-led growth. The eight countries analysed in this report reflect varying agriculture growth, as well as different stages of the nutrition transition (Paarlberg 2012). Along this transition, the food and agriculture system is also undergoing structural changes. Ministry structures and local capacity are being developed, and systems of monitoring, evaluation and accountability are increasingly informing policy and programme decisions. Overall economic changes are also transforming the direction of nations.

Second, in all eight countries, there is room for improvements in the nutrition status of the populations. Undernutrition remains an issue across low- and middle-income countries, especially among children, while the incidence of overweight, obesity and nutrition-related non-communicable diseases is increasing. Brazil and Thailand have both dramatically reduced their rates of undernutrition, but they now face serious population health risks associated with overweight and obesity. In light of the multiple burdens of malnutrition, the case studies attempt to examine both sides of the malnutrition problem.

Third, all eight countries have a multi-sectoral nutrition plan and some have gone further to ensure that district-level strategies are budgeted and being implemented, including Malawi, Mozambique, Nepal, and Sierra Leone. Nepal has achieved reductions in childhood stunting. Brazil, Malawi, and Senegal have made bold moves to improve the agriculture and food insecurity situation in their respective countries. Of the eight countries, five of the eight have signed up to be part of the Scaling Up Nutrition (SUN) movement.

Figure 2: Eight countries included in the study



3.3 Data Collection

Country cases included analysis on the engagement of the agricultural sector with the broader food supply chain; the national food, agricultural, and trade policies; and the potential link of these policies to nutrition and health outcomes in the country. The detailed specifications and analysis frameworks were elaborated with a group of experts during the UNSCN [Meeting of the Minds](#) in Geneva in early 2013 (UNSCN 2013)⁶. During this meeting, there was agreement on the common methodological approach for the case studies, a detailed framework of analysis, and a list of research questions.

The methodological approach used independent consultants to conduct the country studies. Data collection included a literature review, a review of existing policies, secondary data analyses, in-country consultations, stakeholder focus groups, and interviews. The consultants reviewed the information from relevant country policy and programme documents and analyzed the direct and indirect impact of national strategies, policies, and investments in food and agriculture on nutritional outcomes. The consultants also analyzed institutional capacity, level of stakeholder participation, and cross-sectoral collaboration and alignment among others.

Data collection was done in two parts. The first part consisted of a desk review prior to a country visit. The second part consisted of consultants traveling to the country for approximately 20 days to gather additional information on strategies, policies, and investments in food and agriculture; their influence on nutrition; institutional capacity; level of stakeholder participation; cross-sectoral collaboration and alignment; and the overall nutrition political economy.

- The desk review consisted of an analysis of nutrition situation and food system with rigorous databases, ex post analysis of country policies and action plans on nutrition, agriculture and food sectors and a literature review (scientific and grey literature of nutrition, agriculture and food system). Independent consultants conducted the country studies.
- In country work consisted of key stakeholder and informant interviews (national government policymakers and experts in specific sector areas relevant to nutrition – mainly agriculture, but also education, health and environmental sectors) followed by a snowballing method to do more in-depth interviews with national partners and experts. Interviews from case studies included: representatives from the Ministry of Planning, Ministry of Agriculture, Ministry of Health; national level SUN movement stakeholders; Renewed Efforts Against Child Hunger (REACH) facilitators and UN country teams (if applicable); international and local Non-Governmental Organizations (NGOs) and Civil Society Organizations (CSOs); and in-country donors, including the donor convener (if applicable). The consultants also analyzed institutional capacity, level of stakeholder participation, and cross-sectoral collaboration and alignment to better understand the political economy. Most of the consultants with country counterparts organized a feedback session with relevant stakeholders that were contacted during the field visit.

The overarching framework used for the country analyses, developed by Gillespie et al as part of the TANDI project (**Figure 3**) (Gillespie et al 2012), guided the data collection for each case study. Each case study consisted of three areas of data collection and analysis. They were: (1) to perform a situation analysis (2) to analysis of the nutrition sensitivity of the specific agriculture and food policies and frameworks that currently exist and (3) to describe policy processes and alignments including cross-

⁶ http://www.unscn.org/en/sessions/unscn_meetings_2013/

sectoral communication and coordination, monitoring and evaluation frameworks. Within each of these research areas, a series of information was collected in each country. Below provides they key questions in the three areas in which consultants framed the case studies.

(1) Perform a Situation analysis

- What is the current nutrition and agriculture situation in the country (using available country statistics and international databases)?
- What is the current food system from food supply to consumption, dietary patterns and the stage of the nutrition transition in the country (using available country statistics and international databases)?
- Are equity, gender climate, and sustainability represented in the food system?
- Which of the existing problems are being prioritized according to the purposes and goals of the current national nutrition policy and action plan?
- What are the main policy frameworks of the current agriculture and food policies in the country and their main purpose(s)?
- How is nutrition referred to in the national food and agriculture policy documents?
- Which language and term with regard to Food and Nutrition Security is used (food security, nutrition security, food security and nutrition; food and nutrition security, or others); and which definitions/concepts are applied?

(2) Analysis of the nutrition sensitivity of the specific agriculture and food policies and frameworks that currently exist.

- To what extent are the specific agriculture and food policies and frameworks that currently exist nutrition-sensitive?
- How far are relevant actions of these nutrition-sensitive agriculture and food policies being implemented sufficiently and how?
- What are the major nutrition-sensitive agriculture/food programmes and projects funded and carried out by donors and NGOs in the country?
- At what point does the food and agricultural system engage/link with relevant policies of other sectors?

(3) Describe policy processes and alignments including cross-sectoral communication and coordination, monitoring and evaluation frameworks.

- Are the government arrangements in place to support and coordinate nutrition sensitive agriculture, cross-sectoral communication and coordination?
- How does the used language and terms on food and nutrition security as applied in the policy frameworks facilitate a more integrated approach and communication across government sectors?
- Is the national monitoring and evaluation framework supporting/could better support a nutrition-sensitive agriculture programme for the country?
- Are there any incentives for sustainable food production? What are incentives and barriers for agricultural and nutrition professionals or organizations to engage with each other in the country and what drives action?
- Are there resource / capacity gaps (financially, human, organizational and institutional) for nutrition sensitive actions, approaches and programming that would need to be addressed in future? If so, which ones?
- What are good practices and lessons learned?

To help guide the consultant, a policy checklist and interview guide adapted by Hill et al 2011 and Pelletier et al 2011 were also developed.

3.4 Data Analysis

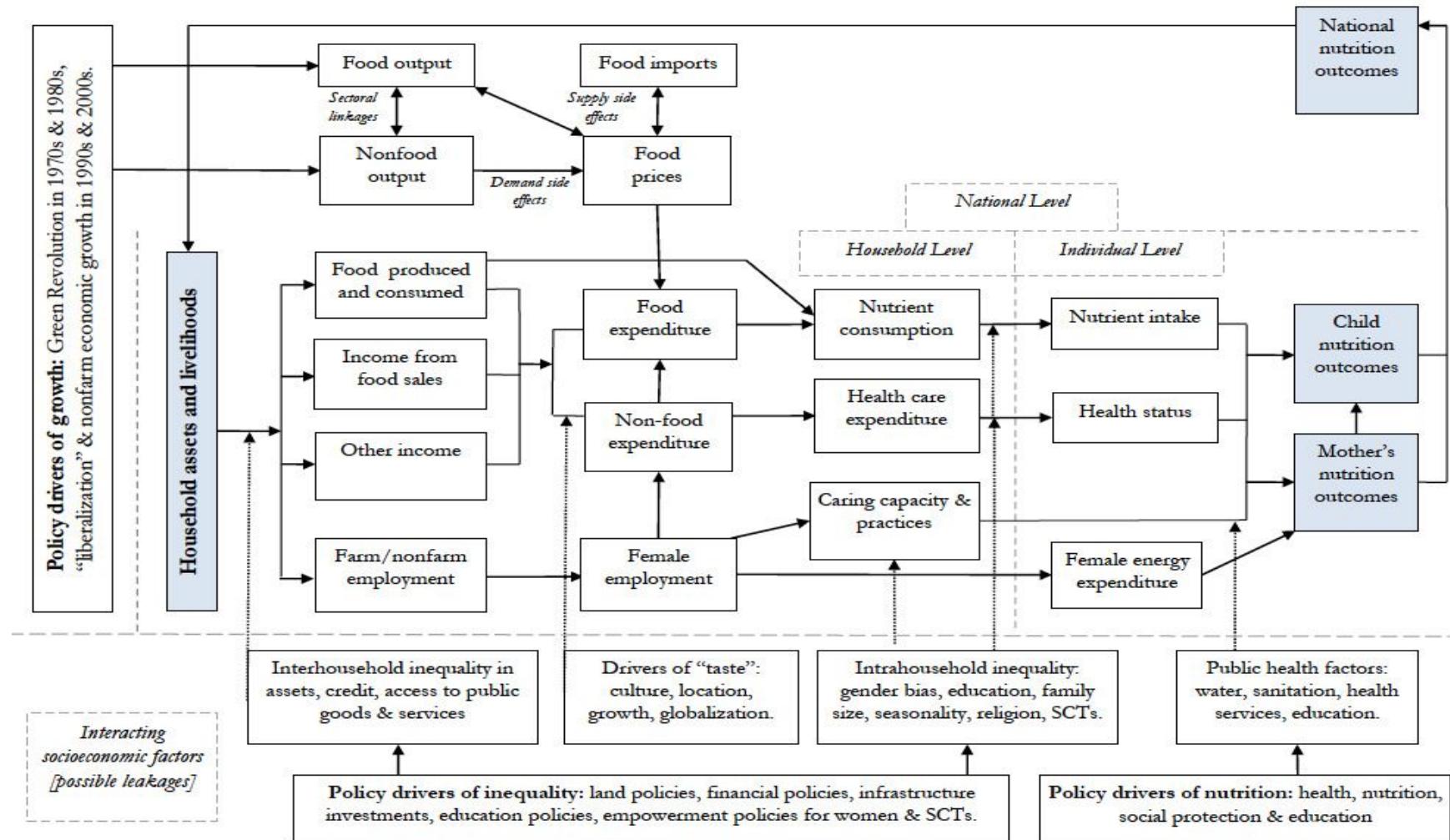
Following country visits and data collection, data was analyzed and a consolidated case study was drafted. In depth interviews were conducted with 165 national stakeholders in national agriculture and nutrition programming in the countries and questionnaires were administered to 31. Some case studies used the Nutrition Sensitive Food and Agriculture Key Recommendations (Herforth and Dufour 2014). Using the policy checklist, consultants examined whether key food and agriculture policies as well as secondary sector policies (such as environment, biodiversity and others) met the principles. A total of 73 food and agriculture policy documents as well as secondary policies were examined using these Principles. Qualitative data analysis was also done utilizing information gathered from in-country focus groups and interviews, the literature review and secondary data analysis. Once the analysis was completed, a draft report was sent for feedback, contributions, and revisions from national focal points that participated in the in-country visit.

3.5 Evaluation Tools

A multi-stakeholder systematic review of agriculture programming for nutrition identified a strong consensus on key recommendations for improving nutrition through agriculture (FAO 2013b; Herforth and Dufour 2014; Herforth et al 2012). These key recommendations summarize and reflect the views of international development institutions and inter-agency United Nations bodies to enhance the impacts of agricultural programmes, policies and investments on nutrition.

Each of the eight country case studies used the Key Recommendations as a tool to assess how well elucidated the “nutrition sensitive” components were outlined in the food, agriculture and secondary related policies. Individual policies were ranked in the case study reports. In this report, a summary of rankings was done for each country based on the policy-oriented Key Recommendations.

Figure 3: Framework adapted for the eight-country study analysis (Gillespie et al 2012)



4. Characterization of the Eight Country Food Systems



Brazil Credit: Divulgação/MDS

4.1 The double burden of undernutrition and overweight and obesity

Agriculture, nutrition, and health are linked in all three stages of the transition but especially in countries classified as Stage One, where a significant proportion of the population remains employed in the agricultural sector and therefore depends directly on farming for both food and income. As nations move through Stage Two and into Stage Three, “the power of good or bad outcomes in the agricultural sector to influence nutrition and health gradually will diminish but can remain significant” (Paarlberg 2012).

Each of the countries studied are in transition, both in their agriculture and food systems as well as the nutritional and health status of the population (**Figure 4**). Although each country is undergoing its own unique dietary and nutrition transition, the countries can be grouped into different stages (Paarlberg 2012). Of the countries studied, Malawi, Mozambique, Nepal, Sierra Leone and Senegal are in the first stage of

the nutrition transition. Brazil, South Africa and Thailand are moving through the second stage of the nutrition transition and are experiencing increasing rates of overweight and obesity, which are characteristic of the third stage of the nutrition transition.

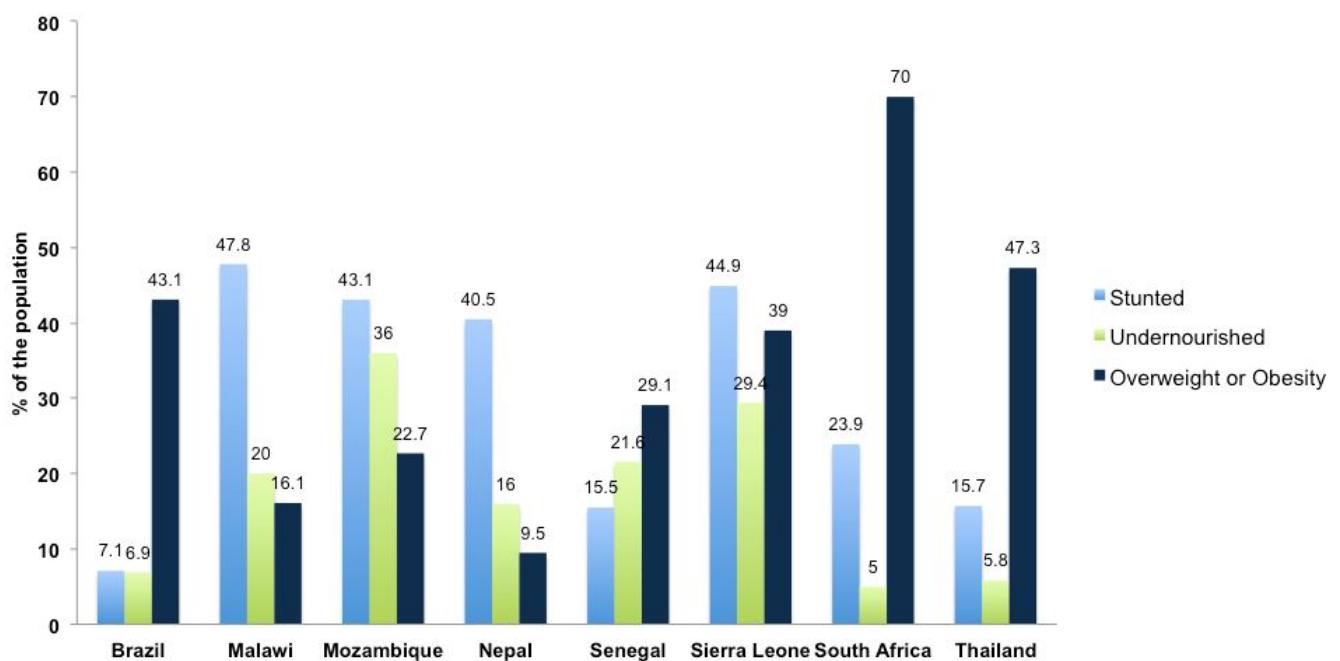
The Three Stages of the Nutrition Transition

STAGE ONE: The average diet is generally low in calories and micronutrients and food is often sourced from smallholder and subsistence farms. This stage is accompanied by high rates of undernutrition and of infectious diseases.

STAGE TWO: The average diet is in transition to a diet that provides adequate basic energy for most of the population but with little diversity an inadequate balance of nutrients. This stage is accompanied by undernutrition with increasing burden of overweight and obesity and non-communicable diseases.

STAGE THREE: People have access to an affluent diet that is energy dense and rich in fat, salt, and highly refined carbohydrates. The food supply systems are abundant, and diverse. This stage is accompanied by a high prevalence of diet and lifestyle-related health problems linked to obesity.

Figure 4: The burden of undernutrition and overweight and obesity in the eight countries studied



As shown in **Figure 4**, the burden of stunting in children under five years of age, remains over 20% in 5 of the 8 countries studied. Malawi, Mozambique, Nepal and Sierra Leone have over 40% of children under the age of five who are moderately or severely stunted. The percentage of the population who are undernourished (an indicator maintained by FAO), demonstrate that there are still pockets of undernourishment even in middle-income countries. While South Africa has less than 5% of their population who are undernourished, Brazil and Thailand still hover over 5%. Mozambique and Sierra Leone are over the 30% threshold. The prevalence of overweight and obese status is also increasing with 5 of the 8 countries studied showing 30% or more of women who are overweight or obese. Thailand, Brazil and South Africa particularly standout, with the latter having an alarming rate of 70% of women

being overweight or obese. Sierra Leone demonstrates an immense double burden with 44.9% of children who are stunted while 39% of women in the country are overweight or obese.

4.2 The characteristics of the food systems

A food system comprises the entire range of processes, people, and institutions that are involved in the production, harvesting, processing, marketing, consumption, and disposal of food goods. These goods originate from agriculture, forestry, or fisheries, and the food system includes the inputs at these origins as well as the outputs throughout the system (SOFA 2013). Generally, the main drivers of food systems are changing from smallholder and subsistence farms to become more industrial, commercial, and comprised of global entities. This allows for increased productivity, specialization, and, in many cases, increased availability and affordability of food for consumers.

However, the focus on increased production in tonnage of staple foods and other cash crops raises questions on the nutritional quality and sustainability of food systems. Food systems can and should contribute to the mitigation of malnutrition, not only through food production and income from food production, but also through actions of the relevant socio-political, economic, and technological players. Increased productivity is important for economic growth, employment generation and food access, but it does not sufficiently address nutrition and all forms of malnutrition.

Below is a summary of each of the eight country's food system and nutrition transition.

Brazil

The major food commodities grown in Brazil include coffee, oranges, and soybeans. The Brazilian diet is shifting from traditional foods that are freshly prepared to ultra-processed foods (Montiero et al 2011). Traditional foods include rice and beans as well as roots like cassava. These foods are being replaced with foods that are energy-dense and rich in salt, sugar, and fat. The reduction in consumption of traditional foods as well as fish, eggs, and vegetables has coincided with increased consumption of soft drinks, cookies, sausages, alcohol, and pre-made meals.

Brazil has two agricultural models that define the food system. The agribusiness model focuses on large-scale monocultures grown primarily for export and the family farming model focuses on smallholder, domestic, diversified production. The agribusiness model is the dominant model nationally, accounting for two thirds of agrarian production, but the family farming model is growing and is responsible for 70% of the food consumed in Brazil. Still, the food system is one of monoculture crop production, as dictated by international market demand, with heavy chemical input and mechanised production among a few large consolidated agribusiness firms (Ionata de Oliveira 2013).

Malawi

In Malawi, maize is both the main commodity grown and a staple of the Malawian diet. It accounts for 60% of total Malawian calorie consumption. Without "nsima," made of refined maize flour, a Malawian meal is considered incomplete. As a largely rural country, maize is cultivated by 97% of all households. Other major commodities include groundnuts and beans. The majority of households rely on the maize food system, as farmers' own production supplies the food for domestic consumption as well as household income (Mayer 2013). Malawi invests substantially in its agriculture sector and is one of the few countries in sub-Saharan Africa that meets its Maputo promises, to spend over 10% of public expenditures on agriculture (12.2%) (HANCI 2013). In 2005, President Bingu wa Mutharika introduced the Farm Input Subsidy Programme to improve national food security and lift the productivity of smallholder

farmers after several years of drought resulted in poor harvests. More than 200,000 Malawian farmers depend on this government subsidy programme to grow enough food to feed their families, and the programme has largely been seen as successful in improving food security for the country (Denning 2009).

Mozambique

Mozambique produces several large-scale crops, including maize, cassava, cotton, tobacco, cashew and sugar cane. Soybean and sesame production are also emerging as major crops. In addition to cultivated crops, animal husbandry serves as a primary area of production within the food system. Poultry is the main product, with cattle breeding in certain concentrated areas. The Mozambican diet includes few fruits and vegetables. Traditional foods like yams are increasingly considered an inferior choice, and people are no longer including them in their diets. Seventy percent of the country depends on agriculture, and the agricultural sector employs 90% of the country's female labor force and 70% of the male labor force. Unfortunately, the food system is defined by the limited development of agriculture, limited access to the market, and low productivity of food crops, which results in a net import of agricultural products in Mozambique (Ionata de Oliveira 2013).

Nepal

In Nepal, the major crops are paddy (unmilled rice), wheat, maize, millet, barley, and legumes. Cereal crops are predominant in agricultural production, with 72% of all agricultural households cultivating paddy, 64% cultivating maize, and 57% cultivating wheat. The Nepali diet varies depending on the landscape - the Terai (fertile lowland plains) population consumes rice and wheat, the Hill population consumes maize and millet, and the Mountain diet consists largely of millet, maize, and barley. Imports and government transportation of rice has led to increased rice consumption in the Hill and Mountain areas. Even with this range in diets, overall the Nepali diet is rich in carbohydrates and low in micronutrients. The main Nepali cash crops grown are sugarcane, oilseeds, potatoes and pulses, and the sector has diversified into fruits, vegetables, spices and condiments. While the food system still focuses on the production of cereal crops, the percentage of households with holdings of fruits and vegetables is increasing. This trend has supplemented and changed farmer income, as well as increased the nutrition content of domestically produced foods and diets. However, this will have greater effect with a commensurate increase in the share of land used to cultivate these crops. Livestock and poultry are also considered an integral part of Nepal's food system and are kept by the majority of its agricultural households. The proportion of households that keep animals increased in the past two decades, also contributing to improved nutritional outcomes of agricultural households (Fanzo and Andrews 2013).

Senegal

A largely rural country, Senegal relies predominantly on rain-fed, subsistence agriculture. Despite agriculture representing 75% of the workforce, Senegal remains a net food importer, particularly of rice. The main vegetable cash crops are green beans, tomatoes, melons, and mangoes. Other major commodities include peanuts, cotton, grains, and fish. Fishing offers the biggest contribution to the Senegalese economy. The Senegalese diet includes fruits, vegetables, meats, and grains. A primary constraint for Senegalese agriculture is water. The country depends on water as an agricultural input, but its proximity to the increasingly dry Sahel region makes the country subject to inconsistent rainfall and frequent droughts (Lachat et al 2013). There are some approaches addressing the nutrition-vulnerable population and the use of agricultural programmes as vehicle to deliver nutrition interventions but these are poorly developed in the agricultural sector.

Sierra Leone

Rice is the primary staple crop in Sierra Leone. Two-thirds of the population is involved in subsistence agriculture, and 85% of farmers cultivate rice. Cassava is the next major crop after rice. Livestock is also kept in Sierra Leone, including cattle, sheep, goats, pigs, and poultry, and livestock numbers have been increasing since the end of the 2002 war. Overall, households have good access to markets year-round, and there is high availability of a varied and nutrient-dense diet, with rice, cassava, palm oil, groundnuts, fish, gari, vegetables, and beans available in most markets. However, a household's ability to purchase food items is currently at risk due to the rising cost of food and volatility of market prices. The food system in Sierra Leone is not self-sufficient. Because the country imports much of its food (especially rice), the country remains vulnerable to global food price fluctuations (Wagah 2013).

South Africa

While South Africa is a more urban country, many of the poorer households are involved in crop and livestock production. The primary crops grown are maize, mangoes, papaya, and spinach, and the main livestock reared are cattle and goats. There have been only a few food intake studies in South Africa, but these studies have suggested that the most commonly consumed foods are maize, sugar, whole milk, and bread. Similar to Brazil, the food system in South Africa is split by production into large commercial farmers and small farmers in communal areas. Commercial producers are small in number but contribute greatly to overall production, whereas subsistence farmers are high in number but low in contribution. As a result, the South African diet also features a large percentage of processed foods (Schonfeldt 2013).

Thailand

The food system in Thailand has shifted from a rural, smallholder agricultural system that produced rice, maize, cassava, and sugarcane to a more modernized food production system with growing food exportation. The Thai diet reflects these changes. Total energy consumption has decreased in the Thai diet, but the intake of protein and fat has increased. The Thai diet has shifted from sourcing complex carbohydrates from rice, tubers, dried nuts, and pulses to sourcing carbohydrates increasingly from refined sugars. Consumption of fruits and vegetables is not a daily occurrence, and sodium intake is more than twice what it should be for healthy consumption. Supermarkets and modern food chains have increased across the country, changing the food system landscape and dietary behaviors. Thai consumers have turned from fresh food markets and towards convenience stores and supermarkets (Krisaid et al 2013).

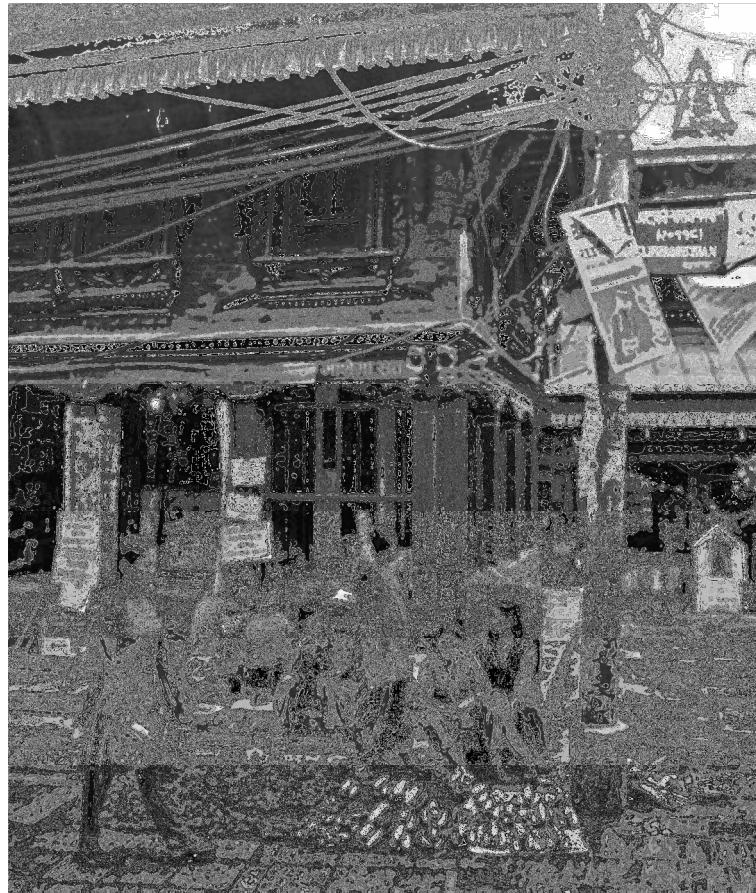
Summary

It is clear that these eight countries have distinct patterns of production and their place on the continuum of globalisation and wealth clearly affects national consumption patterns. The globalising trends are affecting food systems. In some ways, these market forces are allowing for comparative advantage in purchasing much-needed supplements to local production. In other ways, the international markets are ushering in new patterns of consumption that shift populations away from local, nutrient dense foods such as grains and vegetables to processed foods, sugars and fats. Rural populations have access to traditional, locally grown foods, but are also directly tied to fluctuations in local agriculture, making them more vulnerable. Urban populations have more purchasing power, but are further from the base production of local, healthy food. It is therefore the role of national food and agriculture policies to mitigate the trends by supporting healthy local practices of food production and consumption and wisely engaging international markets.



Nepal Credit: Jess Fanzo

5. Findings



Nepal Credit: Derek White

5.1 Aligning agriculture and food policies

Agriculture programmes and investments need to be supported by an enabling policy environment if they are to contribute to improving nutrition (ACF 2013). It is thought that increased attention to nutrition in the agriculture sector is based on the following rationale: (1) nutrition is included in the goals of most agricultural programmes and policies (food security and poverty reduction), and (2) actions to improve nutrition have the potential to remove constraints to productivity and income-generation.

Most country case studies performed a qualitative assessment on the food, agriculture, and nutrition policies and plans using the Key Recommendations for Improving Nutrition through Agriculture (Herforth and Dufour 2014). These country cases assessed the degree to which each policy or plan took the elements of the Key Recommendations (outlined in **Figure 5** in section 3.5) into consideration. The Key Recommendations are divided into recommendations for programmes and those for policies. In assuming that agriculture programmes and investments need to be supported by an enabling policy environment if they are to contribute to improving nutrition, the 8 countries as part of this report, were ranked in their progress towards achieving the 5 Key Recommendations oriented towards policy. The ranking is a composite of all the food and agriculture policies analysed in each of the 8 individual country case studies. Rankings are shown in **Figure 6** with green equaling on track; yellow equaling somewhat on track; and red equaling not on track. The country case studies provide a more thorough analysis of policies that

were considered primary to nutrition, and others considered secondary. **Table 2** outlines the number of policies examined in each country from the agriculture sector, the food sector, a combination of the two, or larger development strategies. **Table 3** shows the major policies analysed for each country. Some countries have made many attempts to draft and institute policies and strategies addressing food and nutrition security. For example in Brazil, Senegal and South Africa over ten policies exist to address the issue.

Figure 5: Key Recommendations for Improving Nutrition through Agriculture

Agricultural programmes and investments can strengthen impact on nutrition if they:

1. Incorporate explicit nutrition objectives and indicators into their design, and track and mitigate potential harms, while seeking synergies with economic, social and environmental objectives.
2. Assess the context at the local level, to design appropriate activities to address the types and causes of malnutrition, including chronic or acute undernutrition, vitamin and mineral deficiencies, and obesity and chronic disease.
3. Target the vulnerable and improve equity through participation, access to resources, and decent employment.
4. Collaborate and coordinate with other sectors and programmes, through joint strategies with common goals, to address concurrently the multiple underlying causes of malnutrition.
5. Maintain or improve the natural resource base critical to the livelihoods and resilience of vulnerable farmers and to sustainable food and nutrition security for all.
6. Empower women by ensuring access to productive resources, income opportunities, extension services and information, credit, labor and time-saving technologies and supporting their voice in household and farming decisions.
7. Facilitate production diversification, and increase production of nutrient-dense crops and small-scale livestock.
8. Improve processing, storage and preservation to retain nutritional value, shelf-life, and food safety, to reduce seasonality of food insecurity and post-harvest losses, and to make healthy foods convenient to prepare.
9. Expand markets and market access for vulnerable groups, particularly for marketing nutritious foods or products vulnerable groups have a comparative advantage in producing.
10. Incorporate nutrition promotion and education around food and sustainable food systems that builds on existing local knowledge, attitudes and practices.

Food and agriculture policies can have a better impact on nutrition if they:

1. Increase incentives (and decrease disincentives) for availability, access, and consumption of diverse, nutritious and safe foods through environmentally sustainable production, trade, and distribution.
2. Monitor dietary consumption and access to safe, diverse, and nutritious foods. The data could include food prices of diverse foods, and dietary consumption indicators for vulnerable groups.
3. Include measures that protect and empower the poor and women. Safety nets that allow people to access nutritious food during shocks or seasonal times when income is low; land tenure rights; equitable access to productive resources; market access for vulnerable producers (including information and infrastructure). Recognizing that a majority of the poor are women, ensure equitable access to all of the above for women.
4. Develop capacity in human resources and institutions to improve nutrition through the food and agriculture sector, supported with adequate financing.
5. Support multi-sectoral strategies to improve nutrition within national, regional, and local government structures.

Table 2: Number of Policies and Plans Analysed by Country

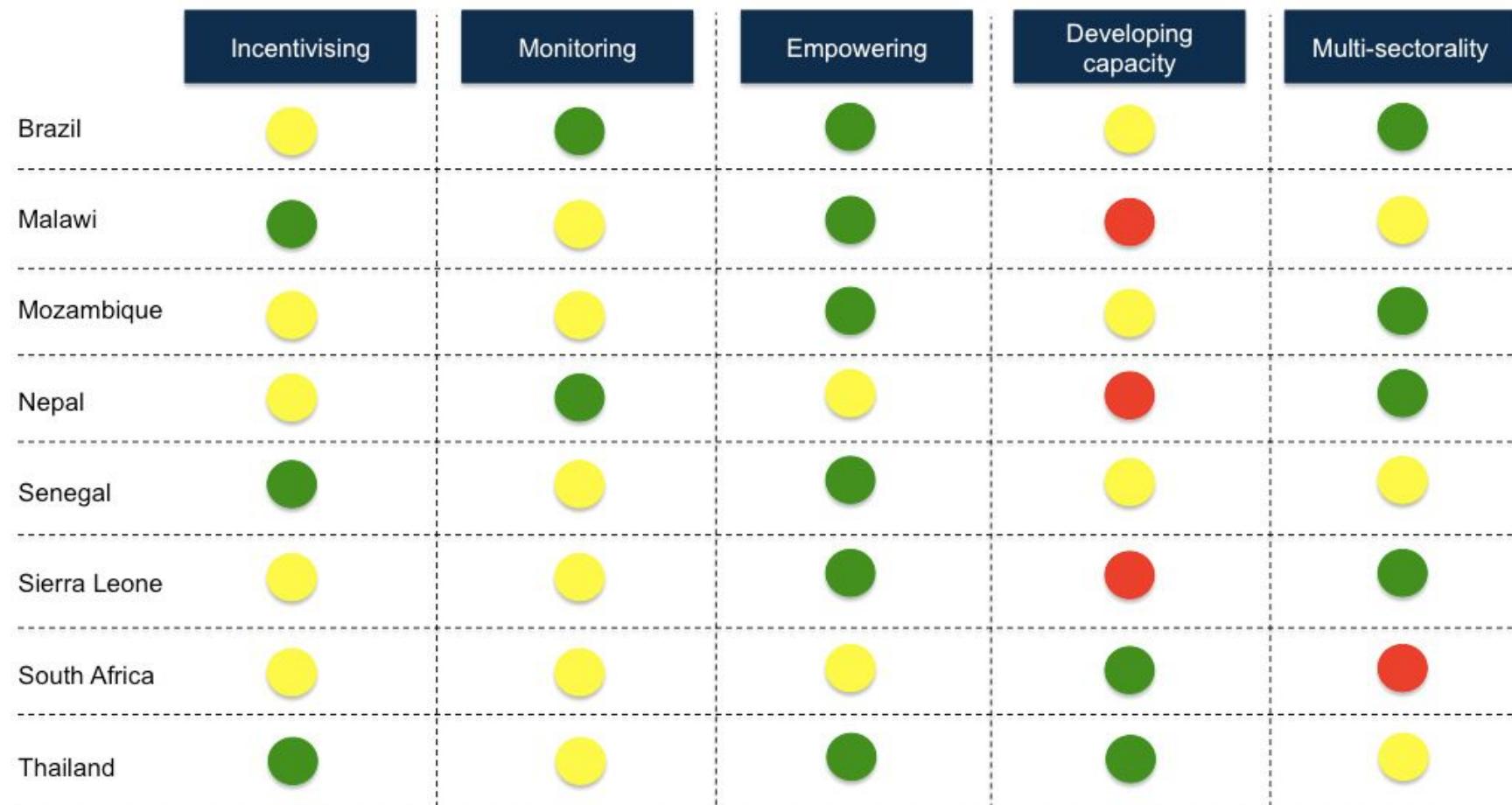
Country	Agriculture	Food	Food and Nutrition	Development
Brazil	6	0	4	2
Malawi	3	2	2	2
Mozambique	2	1	1	4
Nepal	2	0	2	0
Senegal	3	3	4	3
Sierra Leone	1	0	1	2
South Africa	5	2	4	4
Thailand	2	3	1	3

Table 3: National Agriculture and Food Policies and Strategies as entry point for nutrition sensitive agriculture

	Policies
Brazil	National Food and Nutrition Security Policy and National Food and Nutrition Security Plan 2012 – 2015 National Agroecology and Organic Production Policy and National Agroecology and Organic Production Plan 2013-2015 Agriculture and Livestock Plans 2012/2013 and 2013/2014 Harvest Plan for Family Farming 2013-2014 and Harvest Plan for Fisheries and Aquaculture 2012-2013-2014. National Programme for Strengthening of Family Farming Food Purchase Programme
Malawi	Malawi Growth and Development Strategy II (2011-2016) Presidential Initiative on Legumes (2013) Presidential Initiative on small stock production (2013) Malawi Agriculture Sector Wide Approach/ASWAp (2005/2006) National SUN Nutrition Education and Communication Strategy/NECS (2011)
Mozambique	Government's Five-Year Programme (PQG) 2010-2014 Plan of Action for Poverty Reduction (PARP) 2011-2014 Food and Nutrition Security Strategy and Plan of Action (ESAN II/PASAN) 2008-2015 Strategic Plan For Agricultural Development (PEDSA) 2011-2020 National Agrarian Investment Plan (PNISA) 2013-2017 Multi-sectoral Plan for Chronic Malnutrition Reduction (PAMRDC) 2011-2014 Programme Accelerate progress towards MDG1c in Mozambique
Nepal	Multi-sectoral Nutrition Plan for Nepal Agriculture Development Strategy Food and Nutrition Security Plan of Action
Senegal	National Policy Paper on Nutrition (2001) Agricultural Pastoral Orientation Law 2004 – 2016 National Agriculture Investment Plan (<i>PNIA</i>): 2011-2015 Nutrition enhancement programme: phase II strategic plan 2007- 2011 National Strategy for Food Security in Senegal (1999 -) National Strategy and Priority Programs for Food Security (2002 – 2015) Proposed Operational Strategy for the Agriculture (2001- 2005) Special Program for Food Security (1995-1996)
Sierra Leone	National Food and Nutrition Security Policy/Implementation Plan (NFNSP, 2012-2016) National Sustainable Agriculture Development Plan (NSADP, 2010 – 2030) National Health sector Strategic Plan (2010-2015) National Policy on the Advancement of Women
South Africa	Food Security and Nutrition Policy Integrated Food Security Strategy Zero Hunger Programme Aquaculture Programme Biofortification Agro-Processing Food Price Monitoring
Thailand	National Economic and Social Development Plan Strategic Framework for Food Management in Thailand The 11th Agricultural Development Plan 2012-2016 Strategic Framework for Food Security 2013-2016 Agricultural Commodity and Food Safety Standards Strategy 2010-2013 Agriculture for School Lunch School Lunch Programme School Milk Programme

(Only the main policies are included in Table 3).

Figure 6: Rankings of the Food and agriculture policies of the 8 Countries: Achieving the Key Recommendations of Improving Nutrition Through Agriculture



As shown in **Figure 6**, countries have done a fair job in increasing incentives to diversify production access and consumption of nutritious foods but more can be done. Most countries lack the ability to measure and monitor consumption patterns and dietary diversity. One reason is due to disjointed information systems across ministries, but there is also a lack of tested, validated indicators to measure diverse, quality consumption and food composition databases are often outdated or non-existent. Most countries have done well in empowering women through their agriculture and social protection policies and investments. Capacity remains a gap – from community to university levels-- in almost all the countries. Multi-sectoral strategies and true integration across sectors is a mixed bag. Some countries have good intent to coordinate but intent and action are world apart. A few countries are doing actual work across sectors, whereas a very few, engage very little across sectors.

In examining investments, all 8 countries have done quite well ensuring that nutrition objectives, goals and indicators are embedded within in their strategies, however translating this into programmes and practice is another reality. Almost all policies focus on increasing food production, which is the mainstay of modern agriculture. There was also an emphasis on women-led agriculture. Bolstering the engagement of women on an economic and developmental level within agriculture is increasingly recognised as an important investment for countries, and targeting women has strong evidence for improving nutrition outcomes at the household level (Smith and Haddad 2002). Some countries lacked emphasis on post harvest storage, processing and attainment of nutritional quality and nutrition sensitive value chains in their policies.

5.1.1 Country lessons incorporating the key recommendations

Brazil

Brazil is currently undergoing the nutrition transition. Within the past few decades, there has been a decrease in undernutrition as well as large increases in overweight and obesity. Within Brazil's policies and programmes, there is a strong emphasis on increased food production with better storage, targeting of vulnerable groups, empowering women, and detailing explicit nutrition objectives and indicators. However in the seven main policies analysed, there is very little that addresses the burgeoning problem of overweight and obesity. The country's policies contain small pieces of commitments at the local level, including nutrition education and focus on nutrient-rich foods, increase of access to markets, and promotion of dietary diversification. The dichotomy between the two main agricultural models parallels the nutrition challenges in Brazil. The dominance of the agribusiness model reduces the ability of policies to target the most undernourished populations. It also is linked to the consumption of highly processed foods, which lead to obesity. The policies that focus on family farming have more nutrition-sensitive interventions, but face challenges in implementation and sustainability, especially in competition with agribusiness approaches.

Malawi

Malawi has a strong emphasis on nutrition-sensitive agriculture in its policies and plans. Increased agricultural and dietary diversification is included in several policies, as is collaboration across sectors. Most of the policies contain explicit nutrition objectives with clear indicators, and the local nutrition context is considered in several policies. In addition, several programmes and policies are targeted towards the most vulnerable populations and clear reference is made to women's empowerment. Although it is clear that nutrition-sensitivity is prioritised in both the food and agriculture strategies of the country, Malawi can still benefit from increased emphasis on post-harvest processing and storage plans in its policies, as well as expanding markets and market access for the most vulnerable. Coordination between sectors can be improved, as well as monitoring and evaluation systems that can bring to light lessons learned within

implemented programmes. There are several local programmes and movements that have arisen independently of national policies that offer valuable lessons in nutrition-sensitive agriculture.

Mozambique

All of the Mozambique policies analysed exhibit, to some extent, a strong commitment to clear nutrition objectives, women's empowerment, increased food production, improved post-harvest processing, and multi-sectorial collaboration. However, the food and agriculture policies could be stronger on post-harvest processing and on a greater focus on increased production of nutrient-rich foods. The country is weak at operationalising policy and planning at the local level. It also can make strides in considering the natural resource base, expanding markets and access with an increased focus on access to nutrient-rich foods, incorporating nutrition promotion and education, and increasing incentives for availability, access, and consumption of diverse, nutritious, and safe foods. Funding is still an issue in Mozambique, like many of the low-income countries studied. Although commitments are strong at the national level, it will take resources to implement these commitments enough to reach the most vulnerable populations.

Nepal

The government of Nepal has a demonstrated commitment to improving food and nutrition security, which is evident in the planning structure and policies across sectors that emphasise the need for improved nutrition. The country's programmes and policies include focuses on diversification of production, increased production of nutritious foods, improvements in post-harvest processes, and increases in women's income. They could be further strengthened by focusing on additional nutrition education; managing natural resources; and empowering women through multiple channels, such as improving labor and time-saving technologies, access to extension services, and supporting their rights to land and employment. There are also areas where nutrition-sensitive policies in Nepal are particularly weak. The emphasis on local interventions is present in the policies, but more is needed. For example, there is little effort to assess the context and cause of malnutrition at the local level and to incorporate local insights and observations into sub-national planning. The Food and Nutrition Security Plan focuses on vulnerable groups, but there could be additional policy support to expand markets and market access to these groups. The plans could also elaborate on specific measures needed to increase equitable access, availability, and consumption of quality food, particularly in those areas that are geographically difficult to reach.

Senegal

Senegal's policies contain a number of objectives targeting vulnerable populations, empowering women, increasing production and diversification, improving the processing of agricultural products, and collaborating with other sectors. Policy commitments are nascent and clear nutrition objectives are absent in the national agricultural policy. Production of nutrient-rich foods, including nutrient value preservation, reduction in post-harvest losses, nutrition promotion and education, and market expansion and access carry the least focus in the analysed policies. Coordinated action for nutrition has been high on the political agenda for the country for a long time, yet coordination is weak and delivery platforms are not used effectively.

Sierra Leone

Sierra Leone's major food and agriculture policies include objectives and goals on crop diversification, activities addressing the local level, processing and storage, and women's empowerment. There is a nutrition unit devoted to women called Women in Agriculture. The design of agricultural policies and programmes has also included explicit points on nutrition. However, the country is weak with respect to multi-sectoral responses on the ground, despite having strong multi-sectoral partnerships. Sierra Leone's policies include essentially no consideration of the double burden of malnutrition. Current projects have

not been designed to effectively improve nutrition outcomes, nor is there a large-scale agriculture project that focuses on nutrition at the country level. Given the ample resources including access to water and fertile land, there are many opportunities for Sierra Leone to effectively implement nutrition-focused agricultural strategies.

South Africa

South Africa ranked highly in the current policies and plans in regards to the expansion and access to markets, as well as nutrition promotion and education. Several policies facilitate crop production diversification. However, more can be done to strengthen the existing policies and programmes. To start, there is a need to increase incentives for availability, access, and consumption of diverse, nutritious and safe foods, as South Africa's current programmes are weak in the production of nutritious foods. The country's policies and programmes could also benefit from increased agro-biodiversity, an increase in traditional/indigenous/local foods, and/or biofortification. The value chain could be improved to make nutritious foods more available to specific vulnerable groups, and a greater emphasis should be put on women's empowerment. There is also a lack of awareness of agriculture's role in improving nutrition outcomes. Many stakeholders expressed the belief that agriculture should focus on improving the economy more than or instead of improving nutrition.

Thailand

Thailand's experience shows that agriculture and food systems have a critical impact on nutrition outcomes at the national macro-level and at the micro-level among communities, households and individuals. Agriculture and food sectors have ensured adequate supplies of high quality and safe foods for consumers and for markets. National and local initiatives have succeeded in increasing food accessibility, consumption, and utilisation, particularly among vulnerable groups in rural, low-income areas that have been prone to malnutrition. The multi-sectoral efforts of the agriculture and health sectors, coupled with effective community participation under the nation's Poverty Alleviation Plan, have succeeded in greatly reducing maternal and child undernutrition. With the increasing prevalence of overweight, obesity, and non-communicable diseases, agriculture and food systems will play an even greater role in ensuring adequate supplies of healthy and safe foods for consumers at local, national, and international levels. Thailand has a strong presence of nutrition indicators within its programmes and policies, and there are a significant number of policies and programmes that address the local level, including community workers and surveys, participation of community leaders, and visible presence of women in health. The policies and programmes address the most vulnerable by targeting pockets of poverty. They do not, however, highlight women as a vulnerable group. Policies have incorporated nutrition promotion and education, including nutrition labeling, and several programmes and plans have included notes on conservation and sustainability. Despite the overall strength of Thailand's policies, they do not adequately address post-harvest loss reduction and improved storage for nutrient-dense foods.

Summary

The eight countries demonstrated that there is a tendency to prioritise more explicit sector goals among Ministries at the expense of nutrition objectives. Many of the food and nutrition security policies analysed do incorporate agricultural objectives, but this was not generally reciprocated. Most of the agricultural policies focus primarily on economic productivity (through increased production of cash crops) and poverty alleviation (through sale of agricultural products) and lack explicit nutrition-focused objectives. A concerted effort should be made to ensure that nutrition is a defined priority and responsibility of the agriculture sector, and ultimately the health and education sectors as well.

Among the countries investigated, challenges related to fostering a “supportive environment” were among the most pervasive barriers to achieving positive nutrition outcomes. Most of the agriculture policies analysed concentrate on increasing production of cash crops and economic growth. These priorities do not naturally coexist with those of nutrition-sensitive agriculture, such as increasing production of nutrient dense foods, improving food processing and storage to retain nutritional value, and targeting populations that are vulnerable to malnutrition.

5.2 Thematic highlights of country case studies

5.2.1 Evidence-based interventions

Evidence-based agriculture and food interventions (that are grounded in rigorous studies) should be a criteria within nutrition-sensitive policies and programmes. Evidence-based interventions that reorient the food system towards a more “nutritious” system include production, diversification, and increased production of nutrient-dense crops and small-scale livestock (Lancet 2013). Improving processing, storage, and preservation can retain nutritional value, shelf life, and food safety, and can reduce seasonality of food insecurity and post-harvest losses. While these interventions do not have specific studies to support them, they are based on broader evidence that “hungry seasons can have long-term impacts on child growth and development, and that, the less food is lost from their harvests, the more food and income farmers have” (Wiggins 2013). Expanding markets and market access for vulnerable groups are another evidence-based intervention, as it is likely to increase income and incentivise production for farmers (FAO 2013a). Similarly, incorporating nutrition promotion and education within food and sustainable food systems builds on existing local knowledge, attitudes, and practices, as supported by a strong evidence base (Spence et al 2013). These, along with other evidence-based interventions, may lead to effective policy-making. Without evidence of a causal relation between the intervention and the intended outcome, well-intended nutritional plans and programmes can have unintended and even negative consequences.

- **Nepal:** The plans and policies evaluated in Nepal include interventions that address several of these areas. There are plans to diversify production for improved food access and diversification, increase production of nutrient-dense foods, reduce post-harvest losses, and increase market access. Within the main Agriculture Development Strategy (ADS), there is a focus on twelve themes that arose out of key policy issues. These themes, ranging from social and regional development to finance to technology to climate change, acknowledge that there are several areas that can be strengthened using evidence-based interventions. However, there is room for an increase of evidence-based activities with a complementary reduction in policies that have either empirically shown little effect or lack a rigorous evidence-based justification. For example, while the ADS and the other reviewed policies include nutrition promotion and education, production and dietary diversification, there could be an even more focused effort to remove interventions (such as cooking classes) that have little to no success and replace these with further evidence-based interventions.
- **Malawi:** Malawi has demonstrated good practice in the use of evidence-based interventions in nutrition-sensitive policies and programmes. Of the nine programmes analysed, eight include items to address increased diversification and production of nutrient-rich foods. Six out of nine include activities or language that aims to reduce post-harvest losses, although the focus could be even stronger. Dietary diversification has a strong presence in the policies, and they are designed to encourage multi-sectoral collaboration to provide support for smallholder farmers.

5.2.2 Double burden of malnutrition

While these countries reflect several stages of the nutrition transition, many are experiencing the double burden of malnutrition—where overweight, obesity, and nutrition-related non-communicable diseases exist alongside hunger and undernutrition, sometimes within the same household amongst undernourished children and overweight mothers (Paarlberg 2012; Joubert et al 2007). This dynamic also exists across one's course of life, as early undernutrition is associated with an increased likelihood for later overweight and obesity status. This double burden of poor nutrition could be better represented in food and agriculture policies, including the 8 studied in this report, as many of the countries are now facing this as an augmented nutritional challenge (Shrimpton and Rokx, 2012).

- **Thailand:** Diet-related non-communicable diseases have become a pressing concern for the Thai society as the Thai economy has grown and urbanisation has grown. With the Strategic Framework for Food Management, there are nutrition indicators that focus on both under-nutrition and overweight and obesity. Several policies under the Ministry of Public Health also focus on obesity and related non-communicable diseases. This has led to policy-backed programmes, including nutritional labeling. Fortunately, the consideration of the double burden of nutrition has not been left exclusively to the Ministry of Public Health. Rather, the National Food Committee allows for multi-sectoral work with academia and the private sector to focus on under- and overweight and obesity.
- **Brazil:** In Brazil, overweight and obesity status is a problem understood by many spheres of the government as a societal rather than an individual problem. The societal focus is starting to shift towards the quality of the diet and lifelong nutrition awareness. A growing awareness of the societal health problems brought on by. While this process is still in its initial steps, the broad understanding about the problem of overweight and obesity has already sparked important actions such as the Inter-sectoral Strategy for Obesity Prevention and Control, which includes nutrition education and other strategies to promote healthy eating in workplaces, in schools, and in the social assistance network. Existing programmes have made progress in promoting healthy eating in schools through healthier school meals, nutrition education, follow up with nutritionists, and encouragement for schools to demand higher quality school meals at the local level.
- **South Africa:** South Africa is in a process of transition – from traditional rural lifestyles to urban, more modern lifestyles. This transition is accompanied by a ‘nutrition transition’ with over 50% of women in the country suffering from overweight and obesity. The situation is worsened by the present economic crisis and increased food prices. Policies have come a long way for South Africa, but they just beginning to address the nutrition-related non-communicable disease issue in the country (Vorster 2010).

5.2.3 Women focused

One crosscutting area that should be integrated into every approach, particularly when addressing hunger and nutrition issues through a multi-sectoral lens is the status of women. Women’s wellbeing, earning potential, empowerment, and education are the driving factors in reducing children’s malnutrition (Smith and Haddad 2002). Women and girls need better access to services such as credit, healthcare, and education (Haddad 1999; Hobcraft 1993), and it is essential to develop and utilise technology and farm implements designed for rural women that will ease their workload (UNHTF 2004). Without the inclusion of women in every component of hunger and undernutrition strategies, success will be limited. In **Figure 6**, the majority of the countries’ main policies examined show a presence of plans and programmes that focus on women.

- **Mozambique:** In Mozambique, women are more likely to experience poverty and malnutrition, with less access to education, formal employment, income, and diversification of income than men. There are significant micronutrient deficiencies and insufficient dietary diversity amongst women, as demonstrated by several nutrition indicators, including anemia and iodine deficiency. Of the main goals of the seven policies, action plans, and programmes considered for Mozambique, only one specifically targets improved access to food and improved nutritional status for women. However, women's empowerment shows up in all seven policies analysed, even if partially. The Plan of Action for Poverty Reduction (PARP) and the Food and Nutrition Security Strategy (ESAN II) promote gender equity by focusing on the health and nutrition of women. PARP and ESAN II highlight promotion of women's roles, ensuring better access to financial services and credit, generating employment for women to increase qualification and participation, guaranteeing access to natural resources, and awarding land title for communities. Goals and specific indicators for reduced micronutrient deficiency in women are another way in which policies and plans are addressing the status of women.
- **Malawi:** Malawi has some of the poorest nutrition statistics of the countries investigated. The nutrition indicators for women show the country to be in the early stages of a nutrition transition, with half as many underweight as overweight adult women. There is not enough support for women farmers. However, there is an emphasis on women-led agriculture in the plans and policies of Malawi. Bolstering the engagement of women on an economic and developmental level within agriculture is increasingly recognised as an important investment for countries, and targeting women has strong evidence for improving nutrition outcomes at the household level. The Presidential Initiative on Small Stock production aims to improve livelihoods of vulnerable groups, specifically women, through sustainable small stock production and marketing. This policy empowers women by promoting their earning potential, but it is not specifically designed to increase consumption of meat for these women and their children. The National Nutrition Policy and Strategic Plan (NNPSP) include items to promote availability, accessibility, and consumption of a variety of foods by women. There are additional policies, including the Agriculture Sector Wide Approach and the National Agriculture Programme that also include measures to empower women.
- **Nepal:** Many women from farming households must take on the task of managing their land in addition to their already extensive obligations at home without the support of outside income. Women that are left to manage their farms in the absence of a male counterpart tend to be overburdened, leading to poverty and poorer nutritional outcomes for the women and their children. In Nepal this dynamic directly affects the nutritional status of rural households, and hampers the county's overall agricultural potential. Therefore, policies aimed at improving nutrition must address the lack of support for female-headed households that are not receiving remittance income. This is most clear in places such as Nepal where many of the men are out-migrating to work in the Middle East region.

5.2.4 Environment and sustainability

Policies addressing issues of sustainability are increasingly important in a changing and variable environment. Ecological disruptions and resource constraints will directly affect agriculture. Climate variability will lead to short-term changes like the increased severity and frequency of extreme weather events, as well as longer-term changes such as sea level rise, mass migrations, and mass extinctions. These are likely to threaten economies that depend largely on agriculture (Mendelsohn and Dinar 1999).

Many studies have focused on specific areas to predict the impact of climate change, and more often than not, the results suggest that climate change will lead to major reductions in agricultural yields (Schlenker and Lobell 2010). Resource constraints include deforestation and the depletion of important soil nutrients and minerals. These issues highlight the need to incorporate climate change and variability, natural resource management, and ecosystems into policies and plans. These policies could be improved to reflect an understanding of the need to adapt and sustain our natural resource base (Beddington et al 2012) while ensuring what would be a “sustainable diet” for future consumers.

- **Brazil:** All the policies analysed for Brazil had some environmental consideration. While some only mention environmental sustainability, many have components that stress sustainable approaches to agriculture, from the funding perspective or the food systems perspective. The National Food and Nutrition Policy include the environment as it relates to changes in food production systems. The National Food and Nutrition Security Policy and its associated plan have some environmental considerations but focus largely on productivity of cash crops. The Harvest Plans also contain elements of sustainability. The National Program for Strengthening of Family Farming includes specific credit lines for investments that promote more sustainable models of production. The aim of this programme is to fund agriculture that minimizes the impact on the environment and even supports restoration and maintenance of land areas. The Food Purchase Programme offers a higher price for agro-ecological and organic products, incentivising sustainable food. While these policies offer up different incentives and practices, they all incorporate sustainability considerations and measures, a necessary step in facing climate change.
- **Malawi:** Malawi's policies and plans contain several innovative approaches towards sustaining resources. The Agriculture Sector Wide Approach supports agro-ecological approaches and sustainable practices. The World Food Programme has provided sustainable methods for agricultural and dietary diversification. There is also a campaign to promote the production of indigenous crops, and there is a significant grassroots movement already using indigenous techniques, knowledge and seed varieties. The Agroforestry Food Security Programme focuses on sustainable measures and has allocated part of its budget to sustainable water management. Nutrition education and promotion have incorporated sustainability practices, with the School Health Nutrition Strategic Plan including resource education. These innovative measures reflect Malawi's incorporation of sustainable practices into its policies and plans.
- **South Africa:** In the National Development Plan, there is an Inter-Ministerial Committee on Food Security that will be advised by a National Food Security Advisory Committee, comprising organised agriculture, food security and consumer bodies, as well as climate change and environmental practitioners. The policy proposes broader consultative forums, with representatives from the public, academic and research bodies, civil societies, and NGO's. Furthermore, the National Land Care Programme (NLP), a community-based and government supported approach to the sustainable management and use of natural agricultural resources may be an important contributor to sustainable food and nutrition security for South Africa. The goal of the NLP is to develop and implement integrated approaches to natural resource management in South Africa. These approaches are ideally efficient, sustainable, equitable, and consistent with the principles of ecologically sustainable development.

5.2.5 Delivery channels

There are many strategies for delivering nutrition interventions through food and agriculture systems. Policies and plans can rely on schools, community leaders, local government, incentives or subsidies, legislation or mass media (Chopra et al 2012). Determining how improvements to nutrition are being delivered is important for comparison across countries. Assessment of a country's delivery mechanisms enables policymakers and researchers to understand if the policies and plans have effectively addressed potential barriers to delivery and implementation, as well as the capacity and training requirements for successful delivery. National policies and plans must incorporate aspects that address the implementation at the local level. Without an effective implementation plan to carry out these policies in the community, there may be little impact. Effective policies and programmes will have implementation methodology carefully integrated so that the plans can reach communities and the most vulnerable populations. Robust evidence encourages the use of community health workers as capable of delivering key interventions and providing treatment and prevention education (Chopra et al 2012). A large-scale study has also been done to assess whether nutrition can be effectively integrated into agriculture extension services. Although this is a promising area of effective delivery with many options on how to incorporate nutrition into extension advice, the evidence on impact is scant (Fanzo et al 2013).

- **Thailand:** In Thailand, the committee linking food, nutrition, and health – one of three committees focused on different aspects of the Strategic Framework for Food Management – relies on community-based programmes, workplaces, and schools as channels to assess nutrition indicators for undernutrition and overweight and obesity. The use of local, community channels is an important strategy to communicate health and nutrition messages to the most vulnerable. Thailand has deployed an extensive village health volunteer network to ensure that these messages reach the intended population. With a ratio of approximately one volunteer for every ten households, this strategy is successfully implementing plans and policies targeting maternal and child malnutrition and other nutrition topics. These volunteers have been trained in basic health issues and are supervised by other local health staff. Currently, there are roughly one million volunteers working in Thailand. They connect with women as the primary caregiver and food preparer. These volunteers also work one-on-one with some of the most vulnerable, including pregnant mothers and infants as well as patients living with non-communicable diseases.
- **Sierra Leone:** Sierra Leone stresses small-scale farmers in several policies since two-thirds of the population relies on subsistence agriculture. This helps to integrate nutrition activities into farmer field schools and strengthen community-based agriculture extension services. Through this channel Sierra Leone can promote food diversification in communities and sustainable income-generating ventures for rural women. There is also a policy to integrate nutrition activities into a related programme, the Farmer Field Schools, which seek to improve food storage, value processing, preservation, marketing, and distribution of agricultural produce. This channel also delivers education on production, diversification, and nutrition. Farmer-based organisations can empower farmers while offering improvements to production, processing, harvesting, marketing, and nutrition.
- **Senegal:** Senegal has a unique delivery platform to build nutrition-related capacity called the Agence Nationale de Conseil Agricole et Rural (ANCAR) or National Agency for Rural Agricultural Counseling. ANCAR is a national structure with a mandate to diffuse technology that was developed through research to the community level. It plays an intermediate role by working with

financing institutions to facilitate access to credit and can also deliver health information to producers through the rural councils when needed through.

5.3 Supporting policies and political processes

5.3.1 Capacity

Human, organisational, and institutional capacity must be strengthened at all levels and across formal and informal sectors for implementation to be effective. The lack of nutrition-related human resources remains an obstacle for implementing nutrition-sensitive agriculture and food-based system approaches. The need for increased capacity involves having an adequate number of staff available to carry out functions, as well as having the knowledge and skill sets needed to design, implement, and monitor more complex multi-sectoral nutrition plans. It is both the nation's capacity to design and implement nutrition-sensitive agriculture approaches and the understanding of the required capacity for efficient service delivery that will allow for effective agriculture and food policies and programmes to be carried out (Potter and Brough, 2004a; World Bank, 2006). The understanding of the system's capacity will come from timely, decentralised, and equitable delivery of nutrition-sensitive agriculture services (Lewis, 2006).

Common challenges in building nutrition-sensitive agriculture capacity include relying heavily on self-reported outcomes (Pridmore and Carr-Hill, 2009), failing to identify systemic deficiencies (Potter and Brough, 2004b), and over-emphasising the staff's skill set (Pelletier et al 2011). There is often extreme information asymmetry between implementing agencies and the various sectors involved, which further impedes the delivery of nutrition services (Walt et al 2008). The bias towards unknown or merely assumed information at every level can negatively impact the ability of a system to deliver nutritional services. Three levels of capacity need to be strengthened in all countries studied: improving high-level knowledge and multi-sectoral training through the education sector, providing trainings to extension workers in various relevant sectors, and ensuring effective implementation.

- **Knowledge:** In Senegal, there are academic universities that grant both masters and PhD level nutrition degrees. Interestingly, academic training in agriculture does include some nutrition courses within the curriculum, though many practitioners working in agriculture feel that their knowledge in nutrition is insufficient and, perhaps more importantly, out of date. Those within the Ministry of Agriculture that incorporate nutrition focus more on animal nutrition, food science, and engineering fisheries and less on human nutrition. In both Mozambique and Malawi, there is generally a lack of professionals who are able to work effectively and deeply in food and nutrition security from the national to the local levels. However, Mozambique has made strides: in 2007, there were 5 nutritionists, and with the help of postgraduate and bachelor degree nutrition programmes, there are currently 45 nutritionists and 90 post-graduate professionals in the area of food and nutrition security in the country.
- **Training:** The nutrition training provided to extension agents at agricultural schools and universities is frequently ineffective and inadequate in many countries. This impedes the ability of extension agents to identify nutritional needs and provide possible solutions (Fanzo et al 2013). Mozambique has been trying to strengthen their extension programme, but thus far the trainings are quite limited with regard to improving diets. South Africa has integrated capacity building for nutrition into several policies targeting the formal education sector, in particular, primary and secondary education.

- **Implementation:** In Nepal there is a need for increased capacity from the bottom to the top for implementation to be effective. The lack of nutrition-related human resources is an obstacle for implementing nutrition-sensitive interventions. These interventions require an increase in the sheer number of staff available to carry out functions, but also more comprehensive knowledge and skill sets in nutrition-sensitive agriculture are needed to design and manage complex intervention programmes (MSNP 2012). It is clear that the Government of Nepal recognises the lack of capacity in the country, and many within the donor community and amongst non-governmental organisations are helping build the capacity that is needed to scale nutrition activities. Both the nutrition and agriculture policies have developed in comprehensive capacity objectives and activities into their overall plans.

5.3.2 Multi-sectoral coordination

One of the key prerequisites of a high-level commitment to nutrition is successful multi-sectoral coordination. This ensures the efficient and strategic delivery of nutrition interventions. For the eight countries examined in this project, most stakeholders agreed that there are sectors that should be more engaged in the planning processes and action plans for nutrition-sensitive agriculture. Many stakeholders perceived that nutrition plans are led, by default, by the Ministry of Health, which is a disadvantage for a true coordinated response. Ministries such as Agriculture, Education, Urban Development and Women, Children and Social Welfare and Protection, and Local Development are seen as secondary. For a truly multi-sectoral response to nutrition to happen, these sectors need to be considered primary and need be effectively engaged from the outset of the strategic planning through implementation and evaluation. This will involve providing incentives and accountability structures for these plans, and the sectors themselves will need to understand how they will benefit if they get involved.

"Approaches and interventions undertaken by a single sector—such as the agricultural community or health community—have characterized the history of efforts to combat malnutrition. These approaches often reflect different understandings of the causes of and solutions for malnutrition. Nutrition interventions in the 1950s and 1960s, for example, could take the form of home economics extension when led by the agricultural sector, or food technology solutions when led by the health sector." [Garret and Natalicchio 2011]

Multi-sectoral coordination, particularly between the agriculture and health sectors, lies at the heart of integrating nutrition into food and agriculture approaches and activities. While there are successful examples of coordination at the grassroots and district levels, there is a need for higher-level support and engagement to replicate and scale successes. A conducive policy environment is the only way that the successful models at project and district levels can be scaled and adapted to other areas and national programmes.

Most researchers and policymakers agree that a multi-sectoral approach to nutrition is the most effective and far-reaching way to address the longer-term, basic causes of malnutrition, as well as the immediate remedy. Working multi-sectorally is not necessarily an objective but a means to achieve improved nutrition. Multi-sectoral actions strengthen nutritional outcomes in three key ways: (a) accelerating action on determinants of malnutrition; (b) integrating nutrition considerations into programmes in other sectors, which may be substantially larger in scale; and (c) increasing policy coherence through government-wide attention to policies or strategies that may have positive or unintended negative consequences with regards to nutrition (World Bank 2012). The integration of nutrition into agriculture (or vice versa) will also ensure that agriculture plays a role in the acceleration of action, support the incorporation of nutrition into programmes, and place nutrition-sensitivity squarely into agriculture policies and implementation plans.

The fact that malnutrition arises out of various social and environmental factors that are addressed by different sectors makes tackling the problem more difficult (Garrett and Natalechio, 2011). It involves a plethora of stakeholders over a wide range, including “families and communities; local and provincial governments; ministries of health, education, food, agriculture, fisheries, and livestock; government departments in charge of income, employment generation, and safety net schemes; non-governmental organisations; private health care providers; and the food industry” (Heaver, 2005). Therefore, securing, sustaining, and managing stakeholder inclusiveness is a particular challenge for countries. Heaver (2005) also refers to nutrition as an ‘institutional orphan’ and thus coordination across ministries and departments is required to achieve results (Alderman et al 2006).

Finding common ground and consensus around the best mix of interventions to address undernutrition is also a challenge. Agriculture professionals have a tendency to perceive food insecurity as being the primary cause of malnutrition and therefore highlight food production interventions. In contrast, health professionals emphasise the expansion of health services. Pelletier et al (2011) found that in the Latin American countries studied (Bolivia, Guatemala and Peru), disagreements between ministries were not usually about technical evidence. Instead, they were more often related to differences in problem definition, the promotion of contrasting intervention models by various institutions, and differing perceptions or ideological positions on the feasibility or desirability of broad-based multi-sectoral approaches versus more narrow, selective interventions (Pelletier et al 2011).

- **Thailand:** Thailand created a policy framework in which all concerned parties work together, and because of this framework there has been greater harmonisation of tasks and common goals, both horizontally and vertically. There has also been effective multi-sectoral participation in policy formulation, implementation, and monitoring and evaluation.
- **South Africa:** In contrast, South African food and nutrition security programmes are largely not integrated, and ministries continue to function in isolation, delivering on their own frameworks and indicators as set out by each Ministry’s Strategic Plan.
- **Brazil:** Multiple sectors have been engaged and coordinated in Brazil, but the level of engagement and collaboration with civil society has also ensured a “participatory democracy,” allowing for effective action down to community level. This participation is seen as one of the most important institutional arrangements in Brazil and has had a positive impact on policy support and coordination.
- **Sierra Leone:** The Agriculture Development Plan for Sierra Leone was drafted in an open, multi-ministerial collaborative consortium facilitated with the assistance of UN interagency coordination mechanisms, such as the UN initiative and Renewed Efforts Against Child Hunger (REACH). Implementation of multi-sectoral approaches has been evident in a few districts, with some challenges, but in most of the other districts, multi-sectoral implementation has not yet been established.
- **Mozambique:** Even though there is understanding and agreement about the benefit of a multi-sectoral approach to nutrition-sensitive agriculture in Mozambique, there are still challenges on how to implement it at national, provincial, and district levels. Programmes related to food and nutrition security are not coordinated as part of a selected food and nutrition security policy. The programmatic structure is still isolated in each sector as opposed to across sectors, and the

existing programmes that address food and nutrition security are not the result of interrelated and synergistic programmes coordinated under a common food and nutrition security strategy. The goals of sector policies explicitly consider coordination, but in practice most activities happen without this proposed collaboration.

5.3.3 Sustained cooperation and collaboration

Government ministries and non-government agencies must cooperate to achieve nutrition goals (Haddad et al 2013). This cooperation should take place through legal frameworks, technical support, and incentive structures to ensure that required resources and information are shared efficiently (Mejia Acosta and Fanzo 2012). The governments that have demonstrated the most success in achieving positive nutrition outcomes have strong executive leadership and are able to promote effective inter-sectoral cooperation to improve food and nutrition security in their countries (Haddad et al 2013). High-level government officials play a decisive role by coordinating actions across ministries and government offices, channeling donor and civil society efforts, and developing compelling narratives around nutrition as a poverty reduction priority.

Coming from different disciplines, agriculturalists and nutritionists adopt different vocabularies and priorities, which constrains cooperation and collaboration (Luoh 2013; Benson 2012). The need for a common language across disciplines has been reiterated, particularly given that “sector-specific dialect” acts as a barrier that manifests itself from the national policy level down to the field. Even where agriculture approaches contain text on nutrition, this guidance still might not be implemented because agriculturalists cannot decipher the text (Fanzo et al 2013). Similarly, many nutritionists have a public health background and very few have a solid understanding of agriculture or a background in education (Fanzo et al 2013).

- **Nepal:** The Nepalese government is transient and as a result, policy mandates change frequently. Without a constitution (with a right to food mandate) or a stable government with long-term positions in ministries, priorities inevitably shift. The result has been commitments that shift with the unstable political environment and less promising chances for sustained change.
- **Brazil:** The demonstrated success and effectiveness of the hunger reduction programmes put in place in Brazil by the former President made it clear that the investments would continue after he left office. The current President supports the initial policies and has continued to expand the programmes. By framing policies and programmes with a food and nutrition security lens, the resulting establishment of legal frameworks and engagement of different stakeholders has provided incentives to ensure that cooperation towards common goals is sustained.
- **Senegal:** Multi-stakeholder collaboration in Senegal has a longstanding tradition, but agriculture has been less involved in nutrition programmes and policies. From the study done in Senegal, there was great willingness to work across sectors and broad consensus that agriculture has an important role to play in achieving nutrition objectives. Cooperation is usually done on a “as-needed basis.” There is little collective and cross-sectoral thinking to share experiences and inform policy development upstream.
- **Sierra Leone:** Coordination of multi-sectoral nutrition action sits with the Vice President’s office in Sierra Leone, but most of the coordination is limited to food and nutrition security with less engagement of other sectors. The national nutrition working group comprises a wide range of

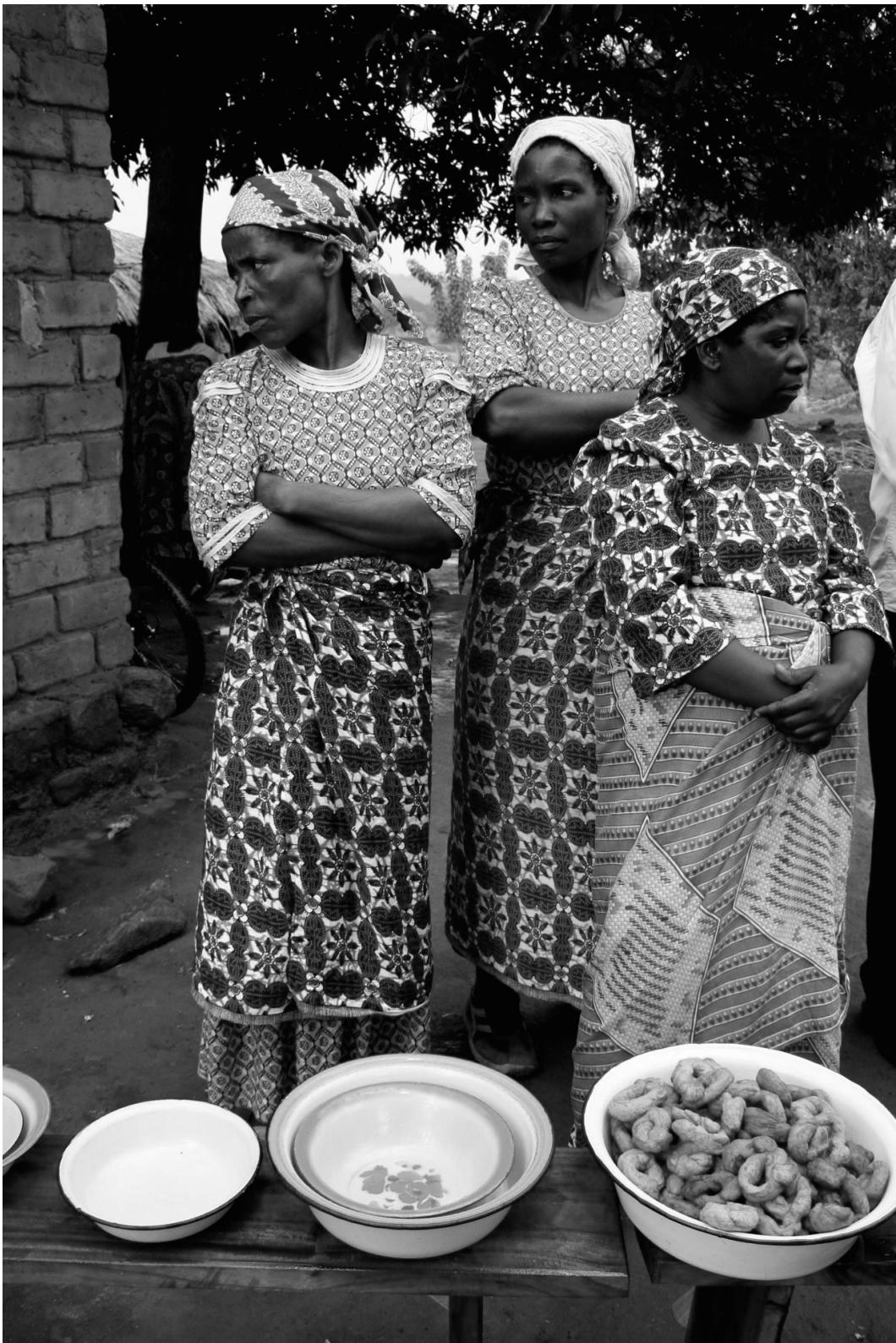
stakeholders representing various sectors, though better coordination at the district level is needed.

- **Thailand:** Active participation of key stakeholders has been essential in all working processes and programmes to address the complexities of the nutrition challenges of both undernutrition and overweight and obesity in Thailand. It is clear that cooperation is needed and that no single sector can act alone, and Thailand has responded accordingly to ensure that nutrition indicators improve. This participation and involvement includes academia, the private sector, and local non-governmental organizations.

5.3.4 District planning

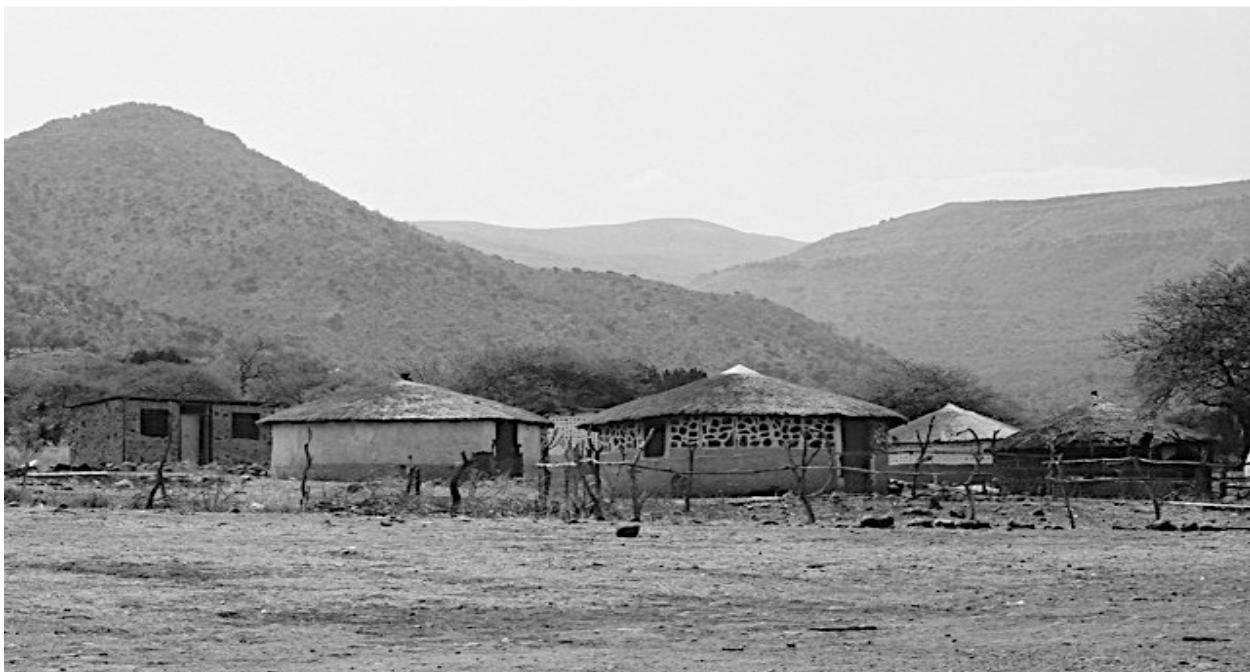
Most policies and programmes are designed at the national level. However, the trickle down of coordination, cooperation, budgeting, and implementation is most important at the subnational, district, and community levels. All the national governments analysed in this report have demonstrated a clear commitment to working with local government to decentralise their national nutrition plans and food and agriculture policies. In addition to this commitment, guidelines, capacity, management, and facilitation are necessary to support and orient local governments on how best to reconcile decentralised planning and implementation with national-level strategic objectives.

- **Nepal:** The Nepalese government decided to implement the multi-sectoral nutrition plan in six districts during its first phase. Within five years of the initial implementation, the programme plans to cover all 75 districts in the country. There is great interest in investing in nutrition at the district level, and there is a willingness to collaborate and coordinate. The spirit of collaboration for nutrition is clearly present in districts, though challenges remain in its implementation. There is a greater need to advocate for nutrition and to ensure that all stakeholders clearly understand their role in the planning, implementation, and effective delivery of nutrition activities in their districts. Several challenges were also identified related to accountability. Questions were raised about who the district nutrition focal point should be, what their responsibilities are, and what technical, administrative and management support should be provided to them.
- **Brazil:** Most of Brazil's food and nutrition security programme implementation is decentralised. The national, regional and local governments have different and complementary roles and responsibilities. All three levels have self-rule, their own laws, and legislative power. Although there are some challenges, this approach favors diversity, local autonomy, and contextualisation of interventions to address region-specific causes of malnutrition.
- **Sierra Leone:** At the high political level, Sierra Leone has effectively worked across sectors to craft a multi-sectoral plan to address nutrition. However, multi-sectoral approaches to improve nutrition have only taken place in a few districts and coordination at the district level is not yet functional.
- **Malawi:** The Department of Nutrition, placed in the Presidential Office in Malawi, has been instrumental in developing a standardised framework. This framework outlines a national multi-sector institutional approach to nutrition, which is reflected from local assemblies up to the district and community level. The Scaling Up Nutrition framework is being set up at district levels, and districts have established coordinating committees, though they require further definition.



Malawi Credit: Jess Fanzo

6. Challenges and Gaps



South Africa Credit: Jess Fanzo

6.1 Externalities: Where policies fall short

At every stage in the dietary and nutrition transition, governments should be seeking positive synergies across these policy sectors while avoiding negative cross-sector dynamics and externalities (Kennedy and Bouis 1990; Paarlberg 2012). Demographic and epidemiological shifts are also occurring along with the nutrition transition and increasing urban population pressures.

It is too early to assess the impact of these policies and plans on nutrition outcomes for each country. It can be assumed that nutrition plans in some cases failed in the past. Overall, it is also safe to say that agriculture has been underfunded and insufficiently engaged in nutrition activities. However, this could change with new, more informed plans in place. Even so, there are external drivers that are beyond the scope of policies and strategies that these countries will inevitably face regardless of how well-intentioned and well-planned a policy is.

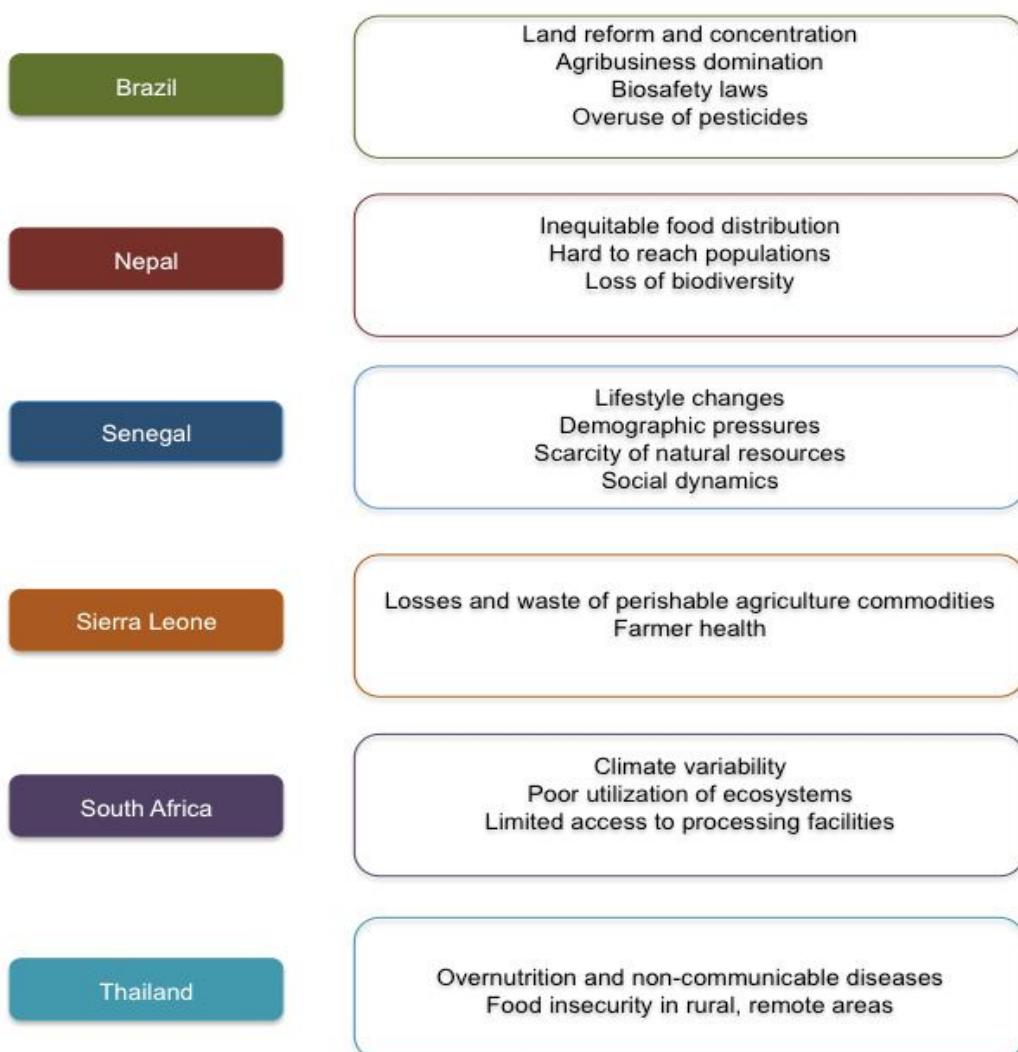
Each of the eight countries studied had their own specific set of external drivers, as shown in **Figure 7**. These drivers complicate the policies' success because even with an increased focus on several nutrition-sensitive actions, there are drivers beyond the current capacity of what could be controlled for.

6.1.1 Climate variability

Every country analysed as part of this report will have to address climate variability and its potential impact on food production. The world is experiencing climate change, which leads to variability and increased severity and frequency of natural disasters. Both floods and droughts will continue to occur more frequently. Predicting weather patterns will become much more difficult as the variability of climate

systems increases (Hansen et al 2007). These changes are likely to have the greatest impact on the agricultural output of many low-resource regions by reducing yields of crops, soil fertility, and forest and animal productivity. This may result in lower income, reduced climate resiliency, and subsequently, decreased access to sufficient, nutrient dense foods, which in turn may impair the nutritional status of many low-income communities (Mason and Shrimpton 2010). It has been estimated that as much as 80% of the burden of disease related to climate change will affect children and that by 2050, there will be a 20% increase in malnutrition (IFPRI 2009). Some studies estimate an even greater impact, with stunting increasing by as much as 30% as compared to a scenario in which climate is stable (Lloyd et al 2011). Climate change may eliminate much of the improvement in child malnourishment levels that would occur in its absence.

Figure 7: Unintended Consequences and External Drivers in Studied Countries



6.1.2 Increased food prices

The global prices for food and related commodities have gone up markedly over the past few years and are expected to remain higher than before (FAO 2011). Places such as Sierra Leone and South Africa are particularly vulnerable to food price increases. The poorest communities, especially female headed-households, will feel the consequences of rising food prices most acutely (Popkin et al 2012). Food prices are expected to be especially volatile in urban areas (Mason and Shrimpton 2010). Increases in food costs force people to reduce the quantity and nutrient-quality of food consumed, disproportionately affecting those with the highest caloric requirement, such as young children and pregnant and lactating women. Even short-term price rises can have severe consequences when they affect children during the critical window of their first 1000 days of life (Brinkman et al 2010). Dietary diversity is a key determinant of nutritional outcomes (Arimond and Ruel 2004) but is sensitive to changes in income levels and food prices. In the face of rapid spikes in food prices with little improvement in incomes, households tend to maintain a minimum level of staple food consumption, even if it means sacrificing more nutritious foods that are necessary to provide the vitamins and minerals needed for good health (FAO 2013b).

6.1.3 Urban migration

As of 2010, more than half of all people live in an urban area. By 2030, this number will increase to 6 out of every 10 people living in cities, resulting in a total urban population of over 5 billion people with most living in African and Asian mega-cities. Nutrition outcomes will surely be affected without the proper planning, infrastructure, and health and social services that are lacking in many lower- and middle-income countries. Currently, an estimated one third of urban dwellers live in poorly constructed shantytowns (Crisp et al 2012). Limited access to social services, inadequate safe and nutritious food, and poor public health infrastructure leave shantytown populations at high risk for both infectious and non-communicable diseases (Popkin and Bisgrove 1988, Popkin 2006).

6.1.4 Dietary shifts

A rapid transition in diet and activity patterns is occurring globally, complementing major demographic and socioeconomic changes. Dietary changes include an increase in the consumption of animal-based products, vegetable oils, sugar, sugar sweetened beverages, and processed foods, as well as a decrease in fibre intake. In urban settings, there is a growing trend to consume processed and packaged foods, which are often low in nutrient quality. These changes, together with a decrease in activity levels, are driven largely by increases in sedentary job opportunities and are resulting in rising levels of obesity in many countries (Popkin and Du 2003, WHO 2013).

6.2 Funding and investing

6.2.1 Funding policies

Action Against Hunger's (ACF) report on Sowing the Seeds (2013) stressed that the low level of funding available for nutrition-sensitive programmes reflects the level of priority dedicated to nutrition within the agricultural sector. ACF recommends that more funding should be dedicated to agricultural programmes and interventions that particularly focus on women in agriculture and vulnerable communities. In order to support nutrition-sensitive agriculture and food policies, "public and private funding organisations should set up funding streams that focus on nutrition-sensitive agriculture and target the various aspects of food and nutrition security and the relevant impact pathways in a systemic way" (Jaenicke and Virchow 2013). Some countries have begun supporting results-based financing and budgeting through a neutral ministry, such as the Ministry of Finance. However, there is often little joint funding to support nutrition-sensitive agriculture or joint projects that focus on health and agriculture.

- **In Nepal**, thus far, funding for the agriculture strategy and its activities is independent from the national nutrition policy activities. As the policies become increasingly decentralised, it remains unclear how districts will handle their allocations of money. It will also be difficult to determine how funds are spent across the agriculture sector, on what activities and from which different funding streams, which are often designated for specific activities. This may also cause some confusion for donors who may want to contribute to the Multi-sectoral Nutrition Plan, but want to focus, for example, on the disadvantaged and vulnerable populations. It seems essential that there be a co-funding mechanism for food and agriculture investments that want to fund specific MSNP activities that focus on the ultra-poor populations that the country's Food Security Plan targets. Separate funding pots will become confusing and difficult to manage at the country level, and donors will worry about absorptive capacity. Perhaps one unified framework and one source of funding for nutrition-related work should be instituted. This will ensure that plans across ministries are coordinated in their structures, capacity and budgeting. It will also be important to understand how the Ministry of Finance will coordinate money flows and expenditures through these different funding streams. The Government of Nepal must create one financial mechanism for nutrition (across the three plans) to protect and earmark nutrition funding and to ensure that it is used in a transparent way (Haddad et al 2013).
- **In Brazil**, most of the programmatic work stemming from policies is funded through the national budget with some additional support from international agencies. The budget for food and nutrition security programmes has been steadily increasing over time with a doubling in seven years. Clearly this funding represents a clear commitment from the government with a high level investment in family agriculture and agribusiness. However, the largest budgetary item is for cash transfers.

6.2.2 Funding Investments

There are costing gaps in nutrition-sensitive interventions and supporting nutrition integration into agriculture investments. There is a lack of investments made to ensure nutrition enters and does not exit value chains. One example of this is Senegal's fruit and vegetable value chains (Lachat 2013). Fruit processors are members of several formal networks, such as the Federation of Agribusiness Professionals (fruit producers and processors), the union of women entrepreneurs, the central purchasing office of food packaging, and the Cooperative of Actors of Horticulture in Senegal. The objective of these networks is to reinforce the activities of individual members. They are formalised structures with an office, a permanent secretariat, and a board, and they hold monthly meetings. The main challenge they are facing is securing funding adapted for small and medium enterprises to expand, buy equipment and access export markets. Guarantees required by banks are difficult for fruit processors to provide and interest rates are too high for them. Although fruit processors are involved in networks, their collaboration is not optimal and well organized.

6.3 Monitoring and evaluation

National surveillance systems are not necessarily set up to report or analyse nutrition sensitive agriculture progress. Sectors and disciplines are only expected to report on data that falls in their mandate. Joint reporting of agriculture and health ministries could be developed. Agriculture policies and frameworks rarely have nutrition indicators. There are very few agreed upon food and dietary indicators that are scaled and collected regularly that link farm systems and value chains to nutrition outcomes. Local ownership of outcome data on nutrition-sensitive agriculture programmes can be important to further enhance dialogue about the importance and impact of nutrition-sensitive interventions. However, this

level of ownership requires data collection at regular intervals. Increased collection of accurate and timely data can provide better response times to re-evaluate programmes.

Data fuels dialogue, incentives, and directives to improve planning and operations. Reliable nutrition data and performance indicators can lead to better delivery. However, there is a lack of comprehensive agriculture, income, and nutrition variables for households at the national and sub-national levels. There is also a dearth of appropriate indicators to accurately assess the impact of production, access, and value chain processes on consumer decision-making, consumption, and diets.

Many stakeholders also argue that more emphasis should be placed on processes that go beyond data collection to ensure that analysis, information sharing, and transfer of data knowledge occur at varying levels, starting with the community. Data analysis and sharing within communities can be achieved by encouraging local and district-level ownership and accountability.

- **Thailand:** The monitoring and surveillance of nutritional status of the Thai population is quite robust in informing the planning of programmes. Furthermore, a national consumption survey was done in 2006, which has been useful in addressing the complexity of overweight and obesity and non-communicable diseases. National surveys are also done yearly on food and agriculture products for consumption and exportation, and a specific national survey on food security and nutrition was conducted, which strengthened the national agriculture and food system database.
- **Brazil:** The Brazilian Food and Nutrition Surveillance System, implemented by the Ministry of Health in 1990, regularly collects anthropometric and food consumption data from users of the Unified Health System to monitor their nutrition vulnerability. There are also regular national surveys that take into account food and nutrition security components. However, there is still a need for a consolidated monitoring and evaluation system to gather information from the many ongoing monitoring and evaluation initiatives, with indicators that express the multiple dimensions of food and nutrition security and the vulnerability of different groups. A matrix of indicators, which later served as a basis for the implementation of a monitoring and evaluation system called DataSAN, has been developed. DataSAN is a system with publicly available food and nutrition security information, provided online through the website of the Ministry of Social Development. This system consolidates information from surveys on a unique platform for follow up of the food and nutrition situation in the country.
- **South Africa:** Effective monitoring and evaluation measures are lacking in South Africa, and there is little integration of data collection systems. There are also very few empirical measures for food and nutrition security or dietary diversity indicators, and there are insufficient assessments being done to address the many dimensions of food and nutrition security.
- **Nepal:** The agriculture and nutrition policies of Nepal have aligned their five-year targets, which is a great step forward. However, the frameworks can be further aligned across the plans. Perhaps one unified framework of nutrition-related components should be established with a set of core indicators. Additionally, the food and agriculture-related indicators, sampling, and methodologies should be consistent, and their indicators should be limited to five to ten core measures that reflect the broader nutrition goals. Currently, there are too many indicators included in the design of these plans.
- **Sierra Leone:** Sierra Leone's Food Security and Nutrition Policy and the National Sustainable

Agriculture Development Plan have elaborate monitoring and evaluation plans, though they remain quite distinct and separate, and their implementation coverage is unclear. The Agriculture policy has very few nutrition indicators, and the plans highlight the need for additional training to ensure more regular, high-quality surveillance.

- **Mozambique:** Monitoring and evaluation strategies in Mozambique are not fully coordinated. Monitoring and evaluation mechanisms are not yet comprehensive, coordinated, or regular. The implementation of programmes is not necessarily informed by the collection of existing food and nutrition security indicators. Nutrition indicators may be present in a strategy, but they generally relate exclusively to the nutrition objectives, and interventions from other sectors are not assessed empirically in terms of their impact on nutrition.

7. Moving Forward and Conclusions



Sierra Leone Credit: FAO

7.1 Commitment of governments

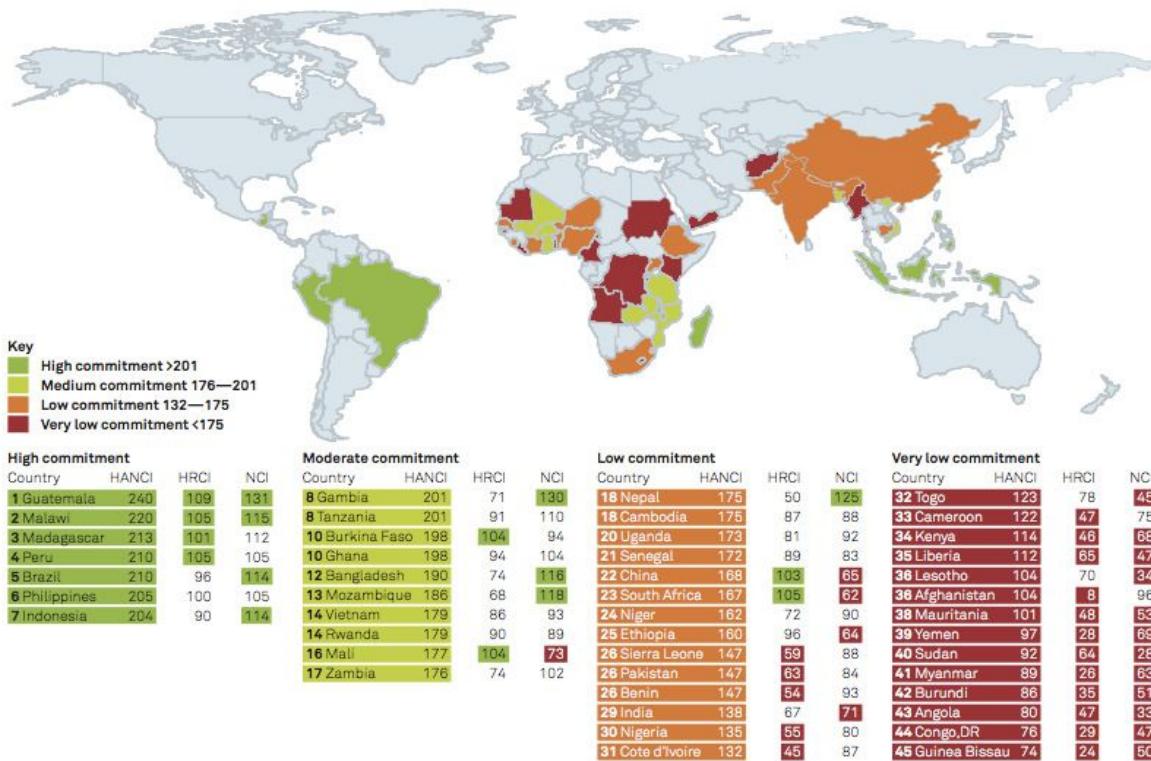
If agriculture and food systems are to meet the health and nutrition needs of their citizens, they must produce accessible, diverse, and healthy food. “Decision makers at all levels, both public and private, must participate in steering the food environment in such a direction. The most important decision makers are national and international policymakers, agri-food businesses, donors in agriculture, nutrition, and health, and, of course, the consumer” (Nugent 2011).

National governments are the most important decision-makers influencing the agriculture and health sectors in developing countries. In the countries examined in this project, there is increased attention to nutrition-sensitive agriculture and food. However, much of this political attention has not translated into practice, at least not at a significant scale. Having comprehensive and well-conceived policies is only one step. Translating the investments and policies into action at the community and household level remains, elusive at this point. Nutrition-sensitive agriculture has yet to be given the priority it requires, often because it is unclear what specific actions should be taken (ACF 2013).

Figure 8 shows that commitment ranges in these countries, according to the Hunger and Nutrition Commitment Index (2013). The HANCI found that Brazil and Malawi score high in their commitment to

reducing hunger and under-nutrition, Mozambique moderate, and Nepal, Senegal, Sierra Leone and South Africa low in their commitment.

Figure 8: Hunger and Nutrition Commitment Index Rankings (HACI 2013)



7.2 The Lessons

While strong government commitment to the achievement of nutrition objectives is a crucial first step, efficient systems, institutional capacity, incentives for multi-sectoral collaboration and dialogue, and monitoring and evaluation systems are central to strengthening the links between agriculture and nutrition. These should be prioritised among governments looking to achieve significant gains in nutritional outcomes. Nutrition is a complex, multi-sectoral challenge and an effective policy response must also be multi-sectoral.

As demonstrated in the country case studies, many policies address pieces of the nutrition challenge, but alignment of these policies lack alignment and cohesion (Levinson and Barjalan 2013; Nugent 2011). This is symptomatic of a policymaking structure that has been traditionally silo-ed into distinct sectors and ministries. Nutrition-sensitive agriculture policies and interventions require policy coherence and multi-sectoral collaboration, including in the mechanisms for funding nutrition activities. Donors should be a part of that collaborative process, facilitating cross-sectoral planning and implementation of nutrition-sensitive agriculture activities.

Because nutrition is often considered an institutional orphan that does not fit neatly into the defined scope of work of any one ministry, a concerted effort should be made to ensure that nutrition is a defined priority and responsibility of the agriculture sector, and ultimately the health and education sectors as well. This

requires systems and mechanisms to ensure that ministries are engaged in the policy dialogue about nutrition and are held accountable for achieving positive nutrition outcomes.

Along with strong leadership and vocal “champions” for improved nutrition, incentive structures must be put in place to facilitate effective collaboration, and capacity building must be prioritised in order to help achieve the needed level of collaboration among relevant stakeholders. There is a dearth of expertise among decision makers and practitioners at every level on nutrition and on the relationship of nutrition objectives with other sectors. The “language” barriers between sectors exacerbate this knowledge gap. The objectives of nutrition and agriculture and health are intrinsically related and often mutually reinforcing, so a clear understanding of those relationships among policymakers, achieved through improved education in nutrition-sensitive approaches and a mutual language for engagement, can break down many of the barriers to collaboration. The multi-sectoral nature of nutrition provides an opportunity to be innovative in policy approaches and incentives. For example, given the importance of proper nutrition on the economic productivity of the population, there is a strong economic justification for using fiscal, trade, and regulatory instruments to support the production and consumption of nutritious foods.

Finally, effective monitoring and evaluation systems are essential for policymakers to achieve substantive gains in nutrition-sensitive agriculture. There is still a significant amount about the relationship between food systems and nutrition outcomes that we do not fully understand, so collection of objective data is key. Clear and defined metrics should be developed to guide operational programmes in agriculture and health toward common goals, and governments should measure and evaluate the contributions of agriculture and food to diet and health. Evidence-based and rigorously grounded monitoring and evaluation systems, with defined metrics and objectives, equip policymakers to be targeted and data-driven in their response to nutrition challenges and facilitate a more productive dialogue among relevant stakeholders. In addition, the growing ubiquity of real-time data collection allows for rapid assessment of implementation needs, advancing the conversation about the challenges, successes, and lessons learned in implementation and impact of nutrition-sensitive agriculture interventions.

7.3 Additional analysis needed

The relationship between nutrition outcomes and broader agriculture and food systems is undeniable. It is clear that the policy priorities for agriculture should include explicit nutrition objectives. What remains unclear is the best path for translating policy into effective programmatic action to achieve the desired impact. More analysis is needed specifically around:

- The challenges of operationalising nutrition-sensitive agriculture policies
- Identifying metrics that effectively measure and evaluate the contributions of agriculture to diets and health, and provide feedback to policies and programmes
- Assessing gaps in skills and required competencies, and making plans to close those gaps
- Understanding long-term implications of nutrition-sensitive agriculture in the context of the increasing global pressures of population growth, urbanisation, and climate change and volatility.

Operationalising policies require a new way of working. Ministries must create systems to engage in policy dialogue about nutrition, allocate sufficient funding for sector-specific nutrition activities and hold themselves accountable for achieving positive nutrition outcomes. Donors should be a part of that collaborative process, facilitating cross-sectoral planning and implementation of nutrition-sensitive agriculture activities. Clear implementation plans are challenging, even when there is collaborative, inter-ministerial effort and policies are well structured and coherent.

Many of the countries studied have taken steps to include nutrition within other ministries' policies, but they have yet to monitor the operational progress at a national, centralised level. As countries begin to implement programmes, they will have the opportunity to undertake analysis beginning at the baseline that will elucidate the factors that hinder and/or advance implementation and best practices for mitigating any challenges. The inclusion of concrete and robust metrics will help assess process, impact, and relevant externalities. Thus far, no consensus has been reached on what a comprehensive set of indicators should look like. There have been a few proposed indicators, but they do not fully capture a holistic and nuanced view of nutrition-sensitive agriculture and its impacts. The full set of indicators must include specific vulnerable populations, such as women; the relative effect of policies on both underweight and overweight status; the geographic distribution of impact, particularly between rural and urban populations; the macroeconomic impacts of such policies, particularly on food prices and trade; and the effect on a range of environmental factors and vulnerability to severe climate events. It will be essential to create a set of widely accepted and applicable metrics and figure out how to effectively collect them.

There are also a number of externalities and components that "we don't know what we don't know" with respect to nutrition-sensitive agriculture. Researchers and policy makers can use effective metrics and systems for monitoring to identify and be responsive to these unknown or unintended outcomes and consequently advance the dialogue about what works in nutrition-sensitive agriculture.

Implementation of nutrition sensitive agriculture also relies on a workforce educated in the relevant skills and understanding the competencies required to carry out the plan. As discussed, there is a lack of expertise in nutrition in most countries included in the analysis and even fewer people with substantive cross-sectoral knowledge. An effective implementation plan must include a human resources strategy to assess the existing skill gap and to build out the required expertise. Best practices should be further evaluated to assess the human resource structures of successful (and unsuccessful) projects.

Even the most effective nutrition-sensitive agriculture strategies reviewed in this report are in nascent stages of implementation and resulting impact. The baseline period of these projects is the opportune time to establish long-term research and monitoring of nutrition-sensitive agriculture.

Demographic and environmental shifts will play a large role in food systems, deeply affecting patterns of production and consumption of nutritious foods. The pressures of population growth, urban migration, and environmental risk and climate volatility, as well as the movement of ideas and technology freely across borders in an increasingly globalised planet will all play a role in those production and consumption patterns. The international community needs to collectively endeavor to understand the resulting impact on nutrition outcomes. Policies need a longer-term horizon that internalises these shifts, as well as the monitoring systems and metrics to interpret the long-term effects and changes.

It is also unclear how middle-income countries – including Brazil, South Africa and Thailand — will effectively address the dietary and nutrition transition that is increasing the overweight and obesity burden and risk of non-communicable disease. This remains a central unresolved issue. Globalisation, trade, food industry, and urbanisation will only become more intertwined with each other and with food systems across countries, regions and the globe. It is unclear how to mitigate the "globesity" trend of increasing overweight and obesity through the agriculture sector. Very few countries at the moment have effectively tackled this issue.

7.4 In the context of the post 2015 agenda

We are rapidly approaching 2015 and the shift to a post-2015 agenda. The Millennium Development Goals (MDGs) have brought much-needed attention to a number of priority areas in sustainable development policy, but the experience of the MDGs has also highlighted a number of shortcomings and gaps in their coverage. While food security was prioritized by the MDGs, efforts for achieving food security have been overwhelmingly characterized by agriculture-driven interventions that focus on a push for increased food production.

Food security will deservedly be a major focus of the post-2015 agenda, and with the experience of the MDGs, it has become clear that nutrition must be central to the post-2015 goals and the strategies put forward to achieve food security. This will require countries to position nutrition objectives explicitly within their broader agriculture agenda. The latest series on nutrition in the Lancet journal also emphasized chronic undernutrition (stunting, not achieving full genetic potential in cognitive and immune development) over acute undernutrition (wasting, starvation). This is particularly relevant to changing agricultural systems to meet not only caloric needs, but also the micronutrient and quality needs of populations.

All of the country case studies demonstrated some level of commitment to achieving positive nutrition outcomes, as well as an understanding, to varying degrees, that the agricultural sector has a pivotal role in nutrition objectives. As we move forward into the post-2015 era, good practices and transferable lessons can be drawn from each country case study, and collectively they highlight the importance of a supportive policy environment, well-developed human capital, and effective systems for planning, implementation, and interpreting impact in building out successful nutrition-sensitive agriculture policies and programmes.



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