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INTERNATIONAL FOOD
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sustainable solutions for ending hunger and poverty

National Food Security Strategy

For the People of the Republic of Yemen

- SUMMARY -

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1 OVERVIEW

The development of Yemen's National Food Security Strategy is motivated by the strong impacts of the recent food, fuel and financial global crises on the country's economy and its people. In addition, it is well understood by policymakers that improving food security will be key for achieving economic prosperity and national security. In response to the request of the Government of the Republic of Yemen, the International Food Policy Research Institute (IFPRI) has supported the development of this Strategy. The project was commissioned by the Yemen Ministry of Planning and International Cooperation (MOPIC) with financial support from the European Commission and was managed by Clemens Breisinger (Project Leader, IFPRI). IFPRI team members include Christen McCool, Xinshen Diao, Olivier Ecker, Jose Funes, Liangzhi You, and Bingxin Yu.

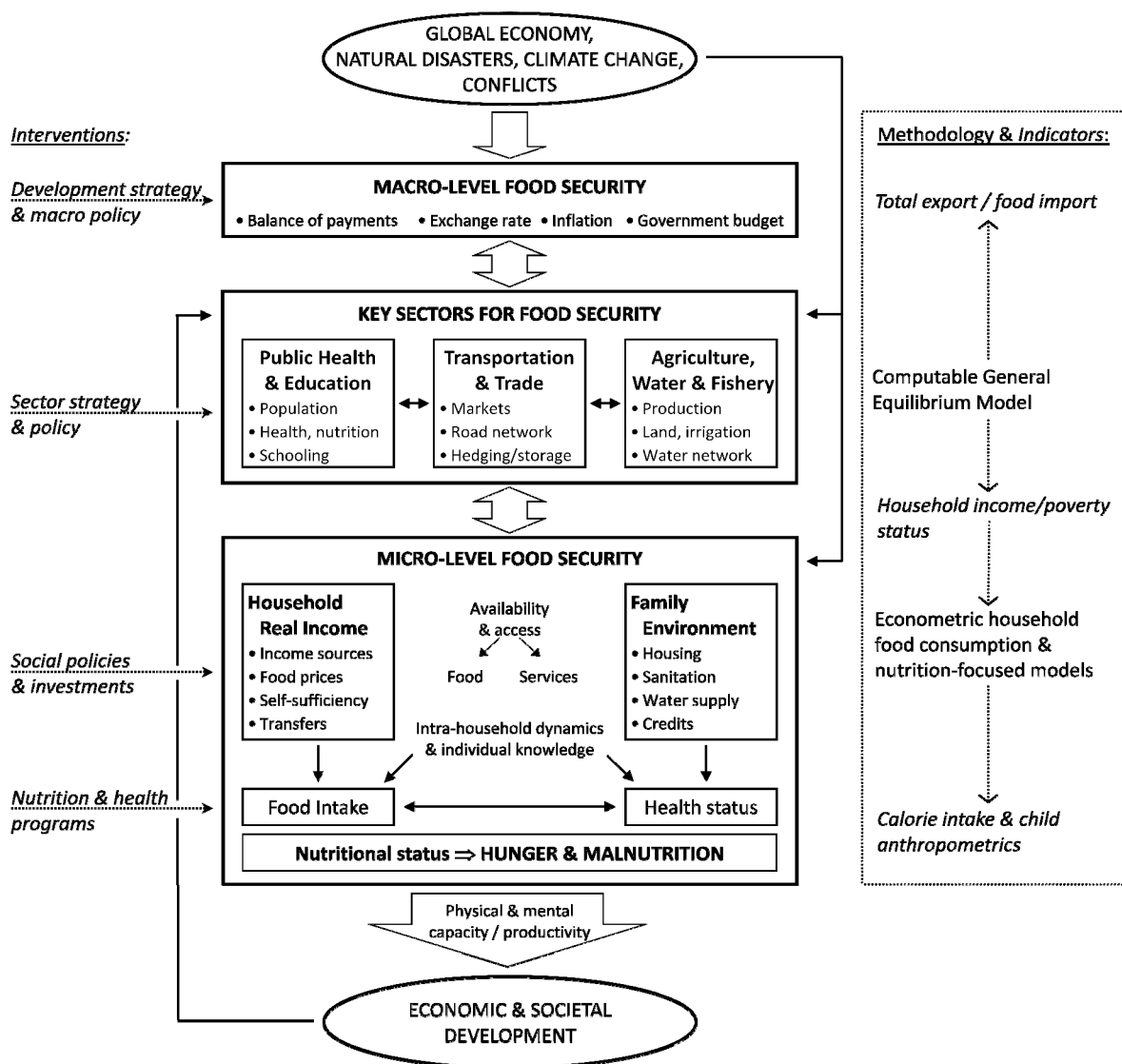
The team is especially grateful to Deputy Minister Abdullah Al-Shater and his team, including Khaled Saeed, Merna Hassan, and Samed Albori for their invaluable organizational and logistical support. Input and guidance on the strategy development process were provided by the Yemeni Food Security Committee, which is comprised of representatives of the ministries of Planning and International Cooperation; Finance, Industry, and Trade; Public Health and Population; Agriculture and Irrigation; Water and Environment; and Fish Wealth, as well as the Social Welfare Fund, the Social Fund for Development, and the Central Statistical Organization. Technical support from Marie-Helen Collion, Pierre Rondot, and Hyoung Gun Wang of the World Bank is gratefully acknowledged. We thank Andrea Zanon of the World Bank and Gian Carlo Cirri of the World Food Program for their contributions on disaster risk management. We also thank Abdulmajeed Al-Bataly of MOPIC; Damien Buchon and Philippe-Georges Jacques of the European Commission; Henning Baur and Thomas Engelhardt of the German Agency for Technical Cooperation; T.G. Srinivasan, Naji Hatim, Safinaz El Tahir, Wilfried Engelke, and Amir Mokhtar Al-Thibah of the World Bank; James Thurlow, John Hoddinott, Todd Benson, Perrihan Al Riffai and Marcia MacNeil of IFPRI; Dominique Anouilh and Marion Saurel of the Embassy of France in Yemen; Rainer Schweickert of the Kiel Institute of the World Economy; Gian Carlo Cirri, Claudia Ah Poe, Lisa Biederlack, and Neville Edirisinghe of the World Food Programme; representatives of the Food and Agriculture Organization of the United Nations, the International Fund for Agricultural Development, Japan International Cooperation Agency, KfW Banking Group, and the United Nations Children's Fund; and many others for their support and suggestions during the strategy preparation process.

This *SUMMARY* of the National Food Security Strategy is based on two National Food Security Strategy Papers (NFSSP).¹ The NFSSP-Part I provides an in-depth analysis of the current state of food security in Yemen at macroeconomic, household and individual level (Chapter 2). It also reviews existing sector strategies relevant to food security and outcomes of the food security workshops, with a focus on the most important sector-level issues (Chapter 3). Chapter 4 analyses major national and international challenges to food security in Yemen and provides an assessment of how they are linked to macro- and micro-level food security. Based on the review of sector strategies and the analysis of major factors challenging food security, Chapter 5 summarizes the main findings and defines a set of 18 priority areas. Based on these 18 priority areas, Part II of the NFSSP assesses different options for achieving Yemen's food security goals and to prioritize policy, investment and program action in 7-Point Action Plan.

2 STRATEGIC FRAMEWORK AND DIMENSIONS OF FOOD INSECURITY

The National Food Security Strategy adopts the universally accepted definition of food security as a situation “when **all people**, at all times, **have** physical, social, and economic **access to** sufficient, safe, and nutritious **food** to meet their dietary needs and food preferences for an active and healthy life” (FAO 2009a, p. 1ⁱⁱ). Following this general definition, the NFSSP considers food security as an *integrated, multi-dimensional, and cross-sector concept* (Figure 1). It differentiates food security at the national level (referred to as macro-level food security) and food security at the household and individual level (referred to as micro-level food security) and emphasizes that improving food security is a multi-sector challenge. To measure food security *at all levels*, the NFSSP uses three indicators: A macroeconomic indicator, dietary energy (calorie) consumption, and children’s nutritional status.

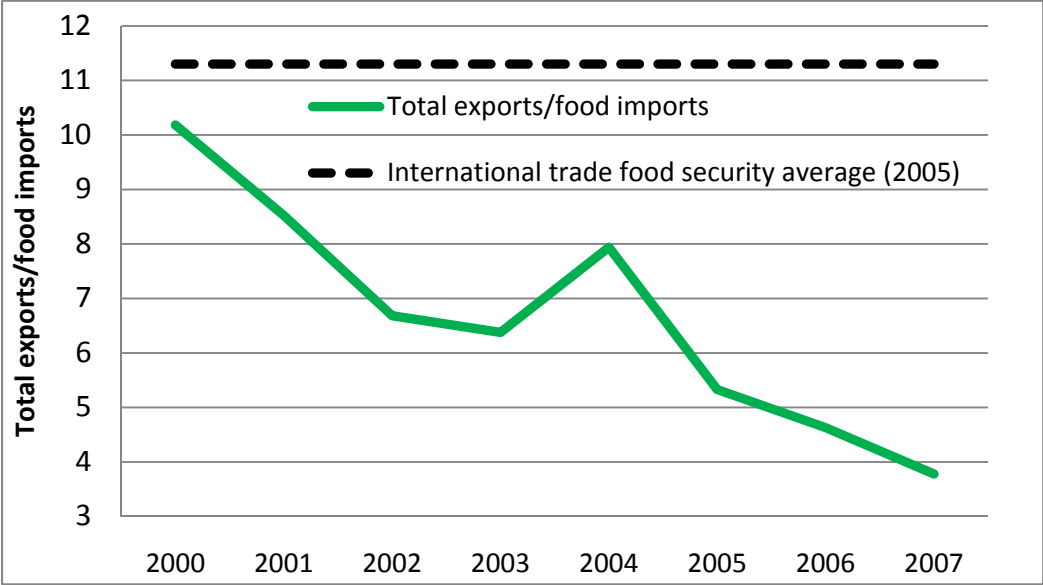
Figure 1. Conceptual framework of the National Food Security Strategy of Yemen



Macro-level food security is NOT equal to national food self-sufficiency; it is rather understood as a situation where the availability of food on the national level equals (at least) the demand of the nation’s population at each point in time. The food demand of the population can thus be met by own food production, food imports, or—usually—a combination of both. In Yemen’s situation of limited production-side potential and rapidly increasing food demand, the supply of food can only be achieved by trading in the global market. In order to be able to import food, Yemen must export enough goods and services to generate foreign exchange.

Yemen’s macro-level food security has deteriorated dramatically in recent years, mainly due to declining oil exports and increasing food imports. A commonly used indicator to measure macro-level food security is the ratio of total exports to food imports. The logic behind this indicator is that as long as the relation between exports (agricultural and non-agricultural) and food imports is within a certain range (that is, the country exports enough to afford food imports), the country is food secure. In 2000, Yemen’s food import-to-total export ratio was only about one percentage point below the international food security line. By 2007, however, the ratio had dropped from above ten to below four—an alarming deterioration of macro-level food security.

Figure 2. Macro-level food security in Yemen (2000–2007)

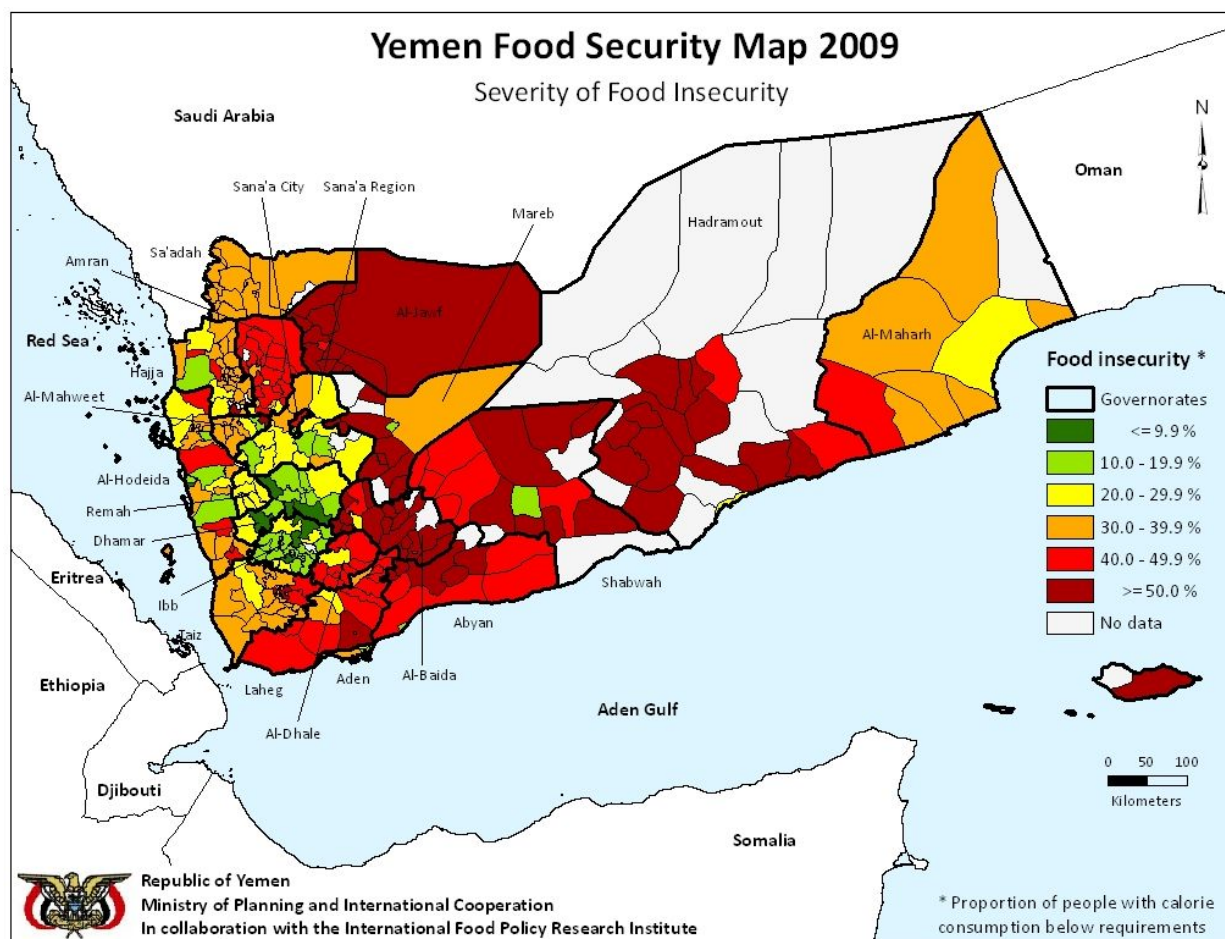


Source: IFPRI, based on World Bank (2009)ⁱⁱⁱ and Yu et al. (2010)^{iv}

Micro-level food security considers both household food security and the intra-household distribution of food, while the nutritional dimension is integral to the concept. The NFSSP takes into account the dual nature of people’s nutritional status, which is influenced not only by food intake but also by the individual health status and the physiological interaction between nutrient absorption and illness. Due to the special role of children in the future development of the society and economy and their high vulnerability, the NFSSP pays special attention to their nutrition and health.

Yemen’s micro-level food insecurity is “alarming” in an international context; 32 percent of the population suffers from food insecurity. Yemen’s food insecurity level is only surpassed by countries like Ethiopia, Congo, and Chad. Countries with food insecurity levels similar to Yemen’s include Pakistan, Cambodia, and Angola. In total, 7.5 million people (equivalent to 32 percent) do not have enough food.

Map 1. Food insecurity by severity in 2009

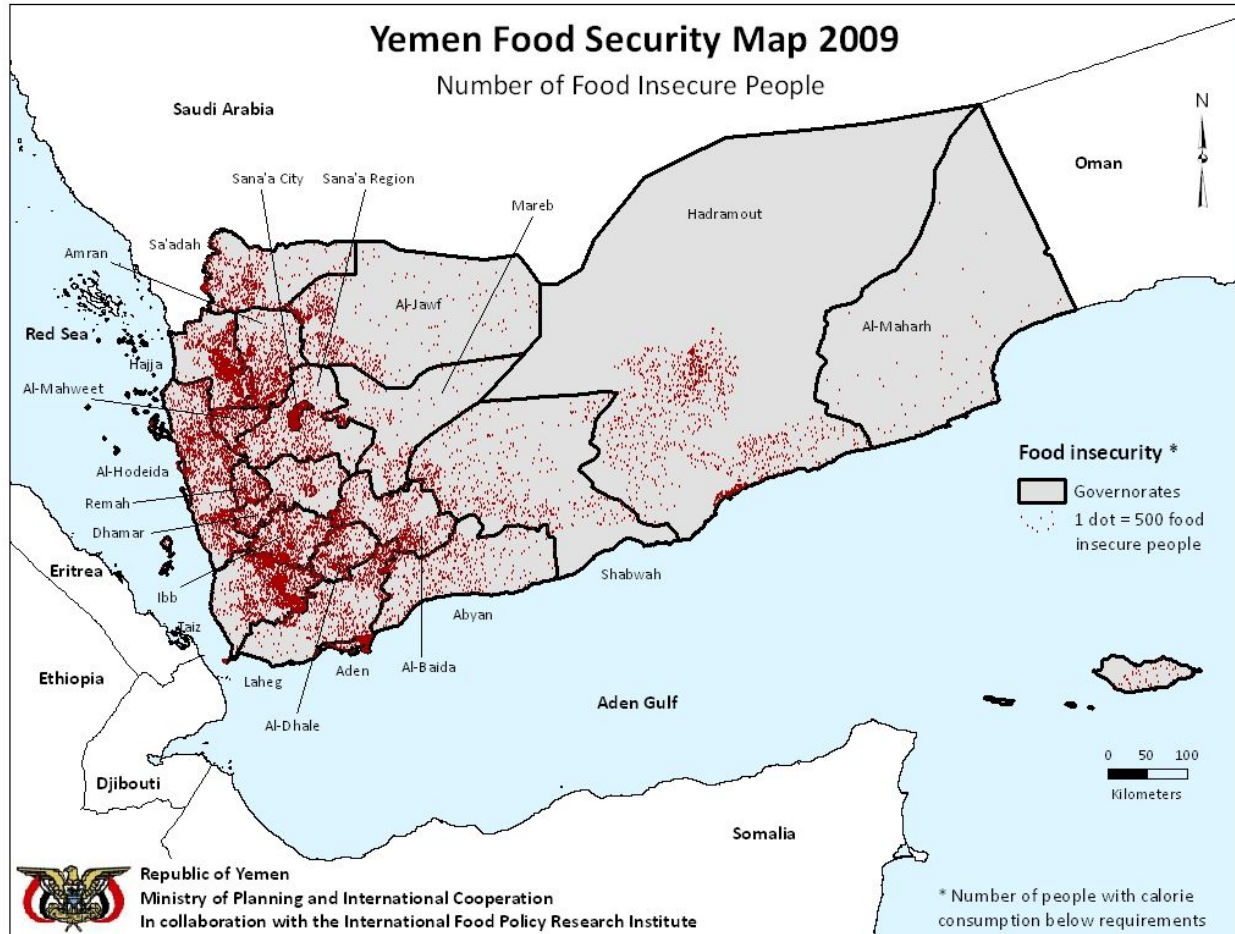


Source: IFPRI, based on 2005–06 HBS data and IFPRI modeling.

Food insecurity is far more widespread in rural areas than in urban areas—37.3 percent in rural compared with 17.7 percent in urban areas. The absolute number of food-insecure people living in rural areas is more than five times higher than in urban areas. There are about 6.4 million rural people suffering from food insecurity, while in urban areas 1.1 million are food-insecure. Within rural areas, food insecurity is highest among rural non-farm households. The proportion of food-insecure people in rural areas is lowest among farm households (30 percent), but it is still 10 percentage points higher than among the urban population. Among both farm and mixed-farm households, the proportion of food insecurity is highest among those who make their living by raising livestock, with levels of food insecurity at around 40 percent. Also in absolute numbers, most food-insecure people live in rural non-farm

households, accounting for 4.5 million of the food-insecure population. Among farming households, livestock farmers are the largest group of food-insecure people, accounting for about 0.7 million people.

Map 2. Food insecurity by number of food-insecure people in 2009



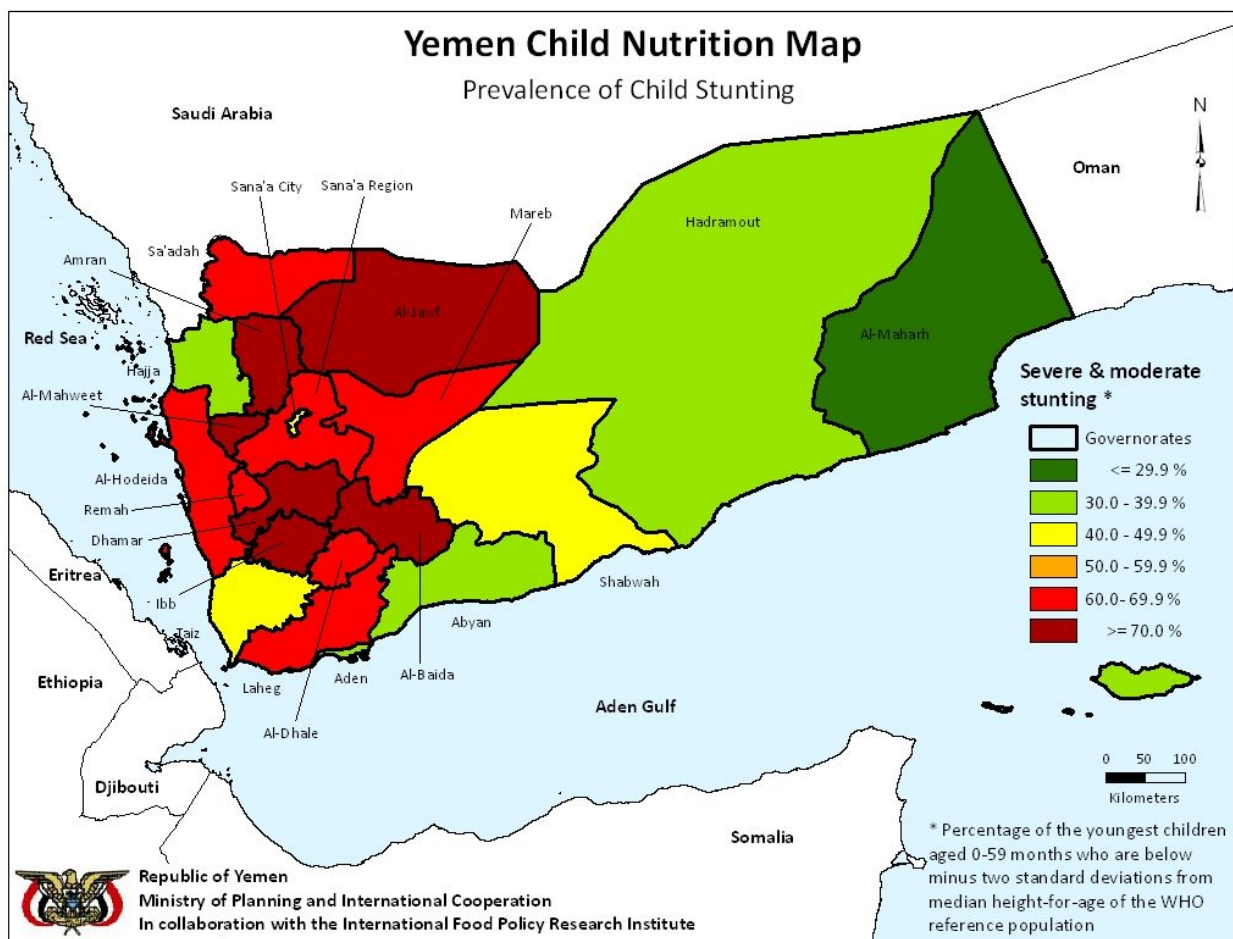
Source: IFPRI, based on 2005–06 HBS data and IFPRI modeling.

At the subnational level, relative and absolute levels of food insecurity vary significantly. The relative food insecurity rate presented in Map 1 reveals large differences in the spread of food insecurity across agroecological zones. The prevalence rate is lower along the Red Sea Coast (in the Red Sea and Tihama Zone) and in the Upper Highlands Zone (which starts at 1,900 meters above sea level), where the country’s capital Sana’a is located. The food insecurity rate rises towards the eastern inland region, which comprises the Internal Plateau and the Desert Zone. The food insecurity rate is lowest in the Upper Highlands (located at an altitude between 1,500 meters and 1,900 meters above sea level), where less than 20 percent of the population resides. It is highest in the Internal Plateau, where more than half of the population is food insecure. Even while the prevalence rate of food insecurity in the highlands is low; in absolute numbers, most food-insecure people are living there. Yemen’s highland region (comprising the Lower and Upper Highlands Zones) is the most densely populated region in the country. Seventy percent of the Yemeni population and 66 percent of the food-insecure live in this region and

most of them live above 1,900 meters of altitude. Half of all Yemen's food-insecure people reside in the Upper Highlands. Map 2 highlights this concentration graphically.

The diet of many Yemeni households is poorly diversified, especially in rural areas, causing a high risk of chronic micronutrient deficiencies. In both rural and urban areas, the diet of many households, and particularly of the poor, is not well-balanced over the main food groups (staple foods, vegetables, fruits, and animal-source foods). Household diets in rural areas are considerably less diversified than diets in urban areas; they contain almost one-fourth less food items on average. These foods are mainly expensive, micronutrient-rich foods such as vegetables, fruits, meat/fish, and dairy products. To avoid hunger, the average diet in rural areas consists of calorie-dense cereal products by more than half (in quantity terms). However, a low consumption of vegetables, fruits, and animal-source is the main source of micronutrient deficiencies. This in combination with a high spread of diseases, such as malaria and intestinal parasitic infections, leads to a high prevalence of iron deficiency anemia and other common nutritional deficiencies such as vitamin A and folate deficiency.

Map 3. Prevalence (in percent) of moderate (and severe) stunting among the youngest children aged 0–59 months by governorate



Source: IFPRI, based on 2005–06 HBS data.

Moderate and severe child malnutrition is highly prevalent, especially in rural areas, thus threatening Yemen's future social and economic development. About 60 percent of the youngest children in Yemeni households are stunted (Map 3), or too short for their age; and more than 40 percent are underweight, or too light for their age. The severe form of stunting affects one-third of all children, suggesting that poor nutrition and health are life-threatening problems for many young children. Child stunting and underweight is much more widespread in rural areas than in urban areas, consistent with food insecurity. Stunting affects two out of three children in rural areas, which is equivalent to a prevalence rate that is 13 percentage points higher than in urban areas. Almost half of all children in rural areas are underweight that are 10 percentage points more than in urban areas.

Both macro- and micro-level food security is highly vulnerable to shocks such as food price surges and climate variability. Important recent examples include the global food crisis in 2007/08, natural disasters such as floods and droughts, and conflicts. At the macro-level, these events can constitute serious balance of payments shocks and shortages in food imports. Households are also highly vulnerable to shocks, especially rural households. The average Yemeni person consumes only less than 300 kilocalories (kcal) per day more than needed to stave off hunger given their current level of activity. Prevention of these external shocks is often only possible to a limited extent. But preparedness, emergency relief, and disaster management plans can cushion the adverse effects of these shocks on food security.

3 VISION, MISSION AND OBJECTIVES OF THE STRATEGY

To guide the strategy development and its implementation, the National Food Security Committee has developed a vision for food security in Yemen. To realize this vision, the Government is embarking on a joint mission with clearly defined goals and instruments to strongly improve food security by 2020. The vision, mission, and instruments that shall guide the strategy and its implementation are as follows:

THE VISION: All Yemeni people have access to sufficient and nutritious food at all times to live an active and healthy life—i.e. all people are food secure.

THE MISSION: Realize food security through a comprehensive, cross-sector, and decisive approach.

THE OBJECTIVES: The strategic objectives against which success in strategy implementation will be judged and progress will be monitored are:

1. To cut food insecurity by one-third by 2015
2. To make 90 percent of the population food secure by 2020
3. To reduce child malnutrition by at least one percentage point per annum

THE INSTRUMENTS to reach these goals are:

1. Decisive policies
2. Targeted investments
3. Smart programs

To accomplish this mission and achieve the goals, cross-sector collaboration in the fields of trade and infrastructure; agriculture, fishery, and water; and public health and education are crucial. The Government of Yemen has realized the cross-sector nature of food security. The Food Security Committee comprises of all relevant ministries, agencies, and other actors, including the Ministry of Planning and International Cooperation, Ministry of Finance, Ministry of Industry and Trade, Ministry of Public Health and Population, Ministry of Agriculture and Irrigation, Ministry of Water and Environment, Ministry of Fish Wealth, the Social Welfare Fund, Social Fund for Development, and civil society groups are all key players in the effort to improve food security in Yemen.

Before developing the 7-Point Action Plan, a preliminary set of priority areas has been defined in a consultative process and by drawing on existing sector strategies. To ensure consistency with other existing documents, the Food Security Strategy has drawn on major existing national documents and sector strategies, including Yemen's Strategic Vision 2025, the Aden Agenda, the National Water Strategy and Investment Program, and the National Nutrition Strategy for Yemen. Lessons from these documents have been complemented by a consultative process, including several technical meetings and workshops, face-to-face meetings and exchange of written comments on Part I and II of the NFSSP.

Based on this consultative process, 18 priority areas have been selected for further quantitative analysis. These priority areas are categorized in accordance with the strategy framework (Figure 1):

A) Macroeconomics, growth, and income

1. Accelerate job creation and pro-food secure growth in promising sectors
2. Foster growth in rural areas, for example, through development of secondary cities
3. Encourage non-oil exports, remittances, and foreign direct investment (FDI)
4. Improve efficiency of social transfers to support the food insecure and review existing subsidies

B) Trade and transportation

5. Improve market access and infrastructure
6. Improve technology in food/fish processing using the private sector
7. Strategize the optimal level of physical storage for cereals
8. Foster trade agreements

C) Agriculture, water, and fisheries

9. Increase productivity in rain-fed and irrigated agriculture
10. Limit cultivation of qat and promote alternatives
11. Increase rural and urban access to water
12. Promote sustainable water management
13. Increase productivity in the fishery sector to fully exploit its potential

D) Public health, nutrition, and education

14. Improve nutrition, especially for women and children
15. Improve health services, especially in rural areas
16. Reduce population growth through family planning
17. Achieve education for all, with emphasis on girls' education
18. Foster links between nutrition, health, and education

By drawing on these priority areas, Part II of the NFSSP quantitatively and sequentially analyzed the impact of selected actions on the main food security indicators chosen: macrofood security (measured as the total export/food import ratio), household food security (measured on a per capita calorie consumption basis), and child nutrition (measured by the height-for-age z-score, which indicates stunting).

4 HOW TO ACHIEVE YEMEN'S FOOD SECURITY GOALS

To prioritize policies, investments, and programs in Yemen, the Strategy uses a socioeconomic food security model to assess the impact of the broad set of options defined during the extensive stakeholder consultations. Essentially, the model compares these policy options to a situation without any additional policy action. This section presents a selected set of results that are consistent with the seven priorities chosen. For the full set of results and a technical description of results, the reader is referred to the National Food Security Strategy Paper, Part II.

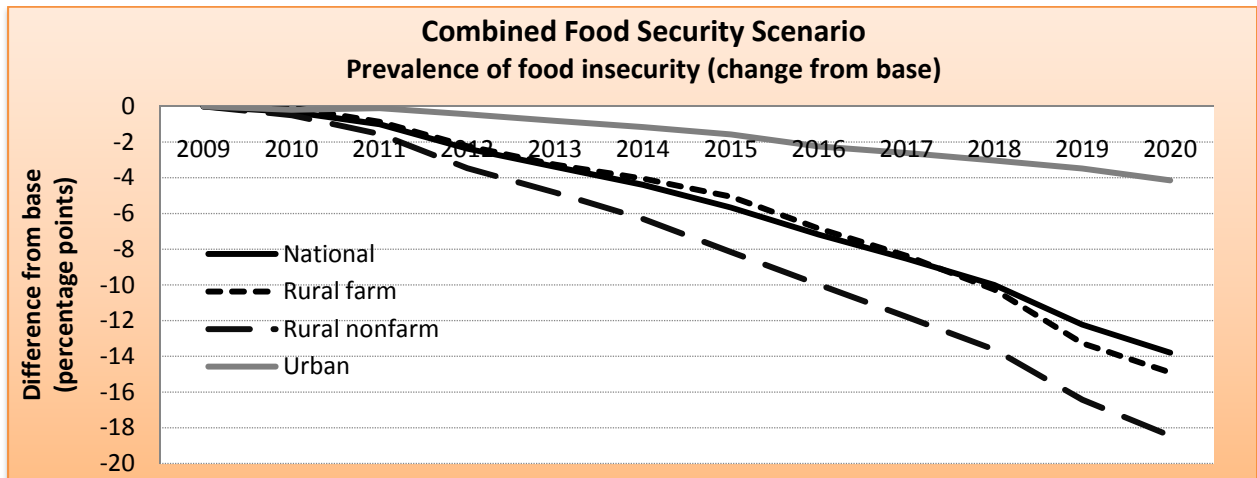
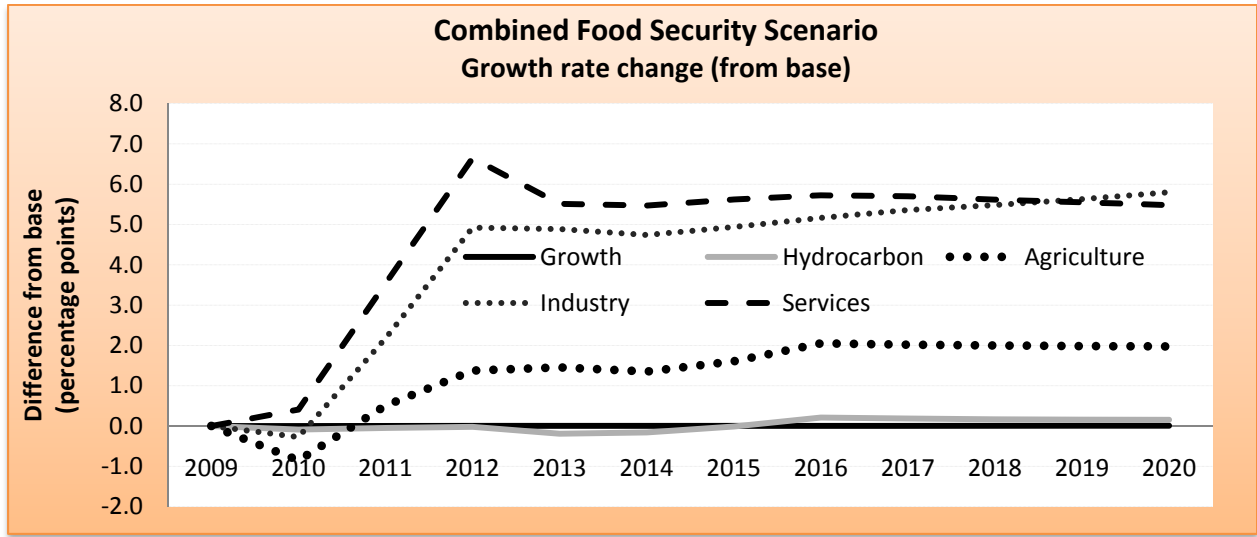
If no action is taken and this Strategy is not implemented decisively, Yemen will miss its food security goals by 2015 and 2020 and the absolute number of food insecure people will increase. The prevalence of food security will remain high at 24.3 percent overall and 29.4 percent in rural areas. Consistent with historical patterns, urban households will benefit most from growth; food security in urban areas will fall to 9.4 percent even without specific policies or investments by 2020. However, given continued high population growth, the absolute number of food insecure people will rise despite falling relative numbers. The total number of the food insecure will increase from about 7.5 million in 2009 to 7.8 million in 2020 if no action is taken. Child malnutrition is highly inelastic to economic growth and remains at very high levels in both rural and urban areas.

4.1 Decisive and Comprehensive Policy Action

None of the policies identified by the Yemen Food Security Committee are able to reach Yemen's goals individually, but Objectives 1 and 2 can be reached if the proposed policy actions are combined. Under the combined scenario, economic growth accelerates to 8.4 percent by 2015 and to 8.8 percent by 2020. This is about 5 percentage points higher compared to a situation without policy action. Growth of around 10 percent in nonhydrocarbon sectors compensates for the continuing decline in the hydrocarbon sector. As a consequence, the hydrocarbon sector sharply loses its significance to the Yemeni economy—the share of the sector falls from 23.4 percent in 2009 to 8.2 percent of GDP in 2020. Growth rises sharply from 2011, driven by growth in industry (especially construction) and services. After this initial spike until 2013, promising sectors in mining and manufacturing drive and sustain growth at high levels throughout 2020. Agriculture grows at 1.4 percent above baseline levels or 4.3 percent annually; yet the sector will be increasingly challenged by serious natural resource constraints.

Macrolevel food security improves from 3.8 to 6.2 points, indicating that instead of using 26 percent of its export earnings to import food, only 16 percent of export earnings will be needed to import food by 2020. The improvement in macrolevel food security is mainly driven by a strong growth in exports, mainly from the promising sectors and tourism. At the same time, the reduction of qat and related increase in cereals production increases domestic supply and the reduction of population growth slows domestic demand. These levels are close to the Middle East and North Africa (MENA) country averages. If complemented by appropriate measures to deal with emergencies such as global food price crises and natural disasters, food security on the macrolevel will be substantially improved under this scenario.

Figure 3. Combined Policy Action Scenario



Food security	2009	2015	2020
Household food insecurity (in percent)	32.1	19.6	10.5
Number of food insecure people (in 1,000)	7,483	5,325	3,134
Per capita calorie gap (wrt. 2009)	-480	-223	176
Child malnutrition (percent)	59.4	56.8	53.5
Rural	63.5	61.0	57.8
Urban	47.7	44.8	41.2
Total exports/food imports	3.83	5.23	6.24
GDP (growth)			
Hydrocarbon	6.7	8.4	8.8
Nonhydrocarbon	4.2	-2.4	-2.1
	7.4	10.4	9.9

At the household level, Yemen reaches its goal of cutting food security by one-third by 2015 and has about 90 percent of the population food secure by 2020. Food security dramatically and steadily falls, driven by sharp increases in income across all household groups. The per capita calorie gap is eliminated, but food insecurity still exists due to unequal food distribution across the population. Compared to the baseline in 2020, food insecurity is 16 percentage points lower in 2020, bringing the food insecurity rate down to almost 10 percent. The rate of the most food insecure group—the rural nonfarm households—drops the most, followed by farm households’ rate. This result is a clear indication that the policies suggested here are pro-rural and pro-food secure. However, despite this strong improvement, food insecurity will continue to be a mainly rural problem. The total number of food insecure people is more than halved, leaving 3.1 million in food security, most of them in rural areas.

The following section summarizes the major policy actions included in the combined scenario.

Petroleum subsidy reform

Petroleum subsidy reform is urgently needed in Yemen—maintaining fuel subsidies is fiscally unsustainable, especially given that oil resources as the main source of government income are decreasing. However, there is widespread concern that removing fuel subsidies will negatively impact growth and lead to an increase in food insecurity. But a reduction of fuel subsidies is also expected to have positive effects, including freeing up a large share of the government budget to be spent on measures that improve food security and sustainably increase agricultural productivity. To analyze the potential impact of a fuel subsidy reform, the scenario looks at the impact of removing the subsidy to assess changes in growth and food security.

The combination of direct transfers and productivity-enhancing investment is a promising strategy for pro-food secure subsidy reform. Transfers, investments, and resulting long-term productivity effects complement each other and lead to a significant reduction in the food insecurity rate. During the initial years, investment-related income, for example, from construction jobs, creates additional income for the food insecure. Then, when investment-induced effects phase out and other sectors start benefitting from new infrastructures, growth accelerates economywide and boosts the incomes of all households, including the food insecure. Growth is especially strong in the industry and the service sectors. The impact on the agricultural sector is positive but limited, caused by the sector’s severe natural resource constraints.

Food security improves sharply, especially when growth accelerates from 2015 onwards. The combination of direct transfers and growth related to additional spending (such as construction) completely mitigate the negative impact of higher fuel prices during the first years and leads to a sharp improvement of food security in the following years. The food insecurity rate drops below 24 percent by 2015 and below 20 percent to 18.8 percent by 2020. This reduction is mainly driven by rising wages and employment in all sectors, also in sectors where the food insecure work. Wages for the unskilled, private sector worker benefits from strong growth; many of the growing sectors are labor-intensive.

However, child malnutrition is not very responsive to growth under petroleum subsidy reform. Despite an overall average annual growth rate of 6.1 percent in nonhydrocarbon sectors, the child

malnutrition rate remains at high levels, with more than half of the children projected to remain stunted in 2020. This not only illustrates how difficult it is to leverage growth for reducing child malnutrition, but also that additional investments and programs are needed to improve children's nutritional status and thus the prospects of Yemen's future generations.

Promotion of growth in promising sectors

Policymakers can make an important contribution to facilitate growth driven by the private sector by improving the investment climate. Improving the investment climate often involves political commitment to reform rather than financial resources, which makes it an attractive and low-cost option for improving food security. Yemen currently ranks 99 out of 183 countries in creating a favorable investment climate; yet, several key indicators are significantly below the international average. While Yemen ranks high in its favorability for starting a business and dealing with construction permits, access to credit, investor protection, and tax requirements need improvement to unleash private sector-driven growth, especially in promising sectors. It is important to note that in order to be pro-food insecure and pro-poor in the long run, private sector-driven growth needs to be both socially and environmentally sustainable.

Foreign direct investment (FDI) plays an important role in fostering growth in promising sectors. The role of foreign investment in development goes beyond filling the investment gap and providing physical capital for growth. Foreign investment comes with new technologies and fresh market opportunities, thus providing opportunities to create a more productive labor force and enhance management skills.¹ Indeed, the Government of Yemen is trying to attract foreign investment. However, FDI inflows have largely been concentrated in the hydrocarbon sectors (oil and gas) and sectors with less linkages with the rest of economy and relatively low spillover effects in technology and labor productivity. Therefore, attracting FDI in labor-intensive sectors, where Yemen has a comparative advantage, will make an important contribution towards achieving the food security goals.

Growth in promising sectors raises the economy-wide growth rate and strongly improves food security. Driven by the promising sectors and their linkages other sectors, the annual growth rate rises to around 3 percent above baseline levels; that is to about an 8 percent annual growth rate in the nonhydrocarbon sector from 2013 onwards. Driven by mining, food processing, tourism, transport, and communication services, both the industry and service sectors contribute to a large increase in household incomes. Despite increasing demand from food processing sector, agricultural growth remains severely constrained by natural resources, so that the sector's growth accelerates by only about 1 percentage point above baseline growth. Promising sectors are also export-oriented, especially tourism, transportation (aviation), artisanal processing of mining products, and coffee processing, thus improving the export to food import ratio.

Growth in promising sectors strongly advances food security, also in rural areas. Given that many promising sectors such as mining, food processing, and tourism generate employment in rural areas, the

¹ See Markusen (2002), Navaretti and Venables (2004), and Helpman (2006) for extensive literature reviews.

rural households stand to benefit from this “pro-rural” growth. Rural food insecurity rate is projected to drop by 8 percentage points by 2020 compared to the baseline. Within rural households, farm households’ food security also improves dramatically despite the sluggish growth of agriculture. Farm households benefit to a large extent from nonfarm incomes, which become an increasingly important source of income in the future. Growth in promising sectors does not reach the urban food insecure to the same extent, which can be mainly explained by their very low initial rate of food insecurity. In other words, the lower the food insecurity rate becomes, the more difficult it is to further reduce the rate by economic growth alone. The food insecure are often unable to participate in the labor market or do not possess the right skills to reap the benefits of growth.

Qat and agricultural policies

Water is the major constraint for agricultural growth in Yemen, and reduced water availability is likely to significantly reduce agricultural and food production in the future. Given the rapidly falling groundwater levels in many regions and the fact that many households lack water for drinking, washing, and cooking, groundwater use for irrigation has to be dramatically reduced. Growth in promising sectors will further sharply limit the availability of water for agriculture due to the rising demand from households and other sectors including manufacturing and tourism. As a consequence, by some estimates, the share of water available for agriculture will fall from the current approximately 90 percent to 60 percent over the next few years. While raising the irrigation efficiency (more crop-by-drop) may compensate for parts of the declining availability of water, water constraints are likely to severely limit the potential for agricultural growth.

One of the few options to maintain current food production levels is to sharply reduce qat production. Qat area has increased from 8,000 hectares (ha) in 1970 to 153,000 ha in 2008. It is estimated that qat uses about 50 percent of all water from groundwater wells, thus constitutes by far the single most important source of groundwater depletion. However, there are major concerns related to qat on the production and consumption sides. Qat production and trade generate income for many people, including influential people. Qat consumption is so entrenched in society and daily life that any attempt to curb consumption may spark discontent among the population. Therefore, many people argue for a gradual approach to tackling this important issue. However, given the dramatic rise of qat production in recent years and its ever increasing consumption, big steps and drastic measures may be required. Households spend a significant share of their income on the stimulant. This share is similar across household income groups, and even food-insecure households spend the same share on qat than food-secure households, so that money spent on qat is not available for buying food, especially for children.

However, any measures imposed for reducing qat consumption (and therefore production) will require a careful communication strategy. According to an estimate from a high-ranking government official of the Ministry of Agriculture and Irrigation (MOAI), the top 11,000 policymakers consume about 20 percent of all qat (in value terms). Given this high consumption among government officials, it will be important for policymakers to set a good example and credibly reduce their own consumption. Without strong commitment of the Government and local authorities, success towards eliminating the qat problem—deeply rooted in the society—is unlikely, because it requires significant behavioral

changes. In addition, anti-qat education in schools can help to reduce qat use of future generations. While most children below the age of 12 do not chew qat, the percentage of young people aged 20 who chew qat is as high as 80 percent.

A reduction in qat consumption and production has a negative impact on agriculture, but the promotion of alternative crops and related marketing can compensate for the loss. The agricultural sector growth remains 1 percentage point below its baseline level. That is a modest decrease given that qat makes up about one-third of agricultural GDP. After the second year, agricultural growth accelerates above its baseline levels for the years in which productivity grows. This is because of the promotion of alternatives to qat, especially coffee, cereals, and related processing. Driven by growth in cereal and coffee production and its forward linkages to the food processing industry, industry and services also grow. Promoting these alternatives should be strongly linked to qat reduction programs, which for example can be financed by a new consumption tax on qat.

The farmers are the biggest beneficiaries from the “qat reduction plus promoting alternatives” strategy. The agricultural sector under this scenario grows at 0.3 percentage points above baseline levels or 3.3 percent on average between 2011 and 2015. Farmers’ food security improves by 3.5 percentage points through an increase in income from agriculture. However, rural nonfarm households and urban households do not benefit from this strategy, since their real income does not change much. Essentially these households are likely to spend the same amount of money for a lower quantity of qat due to a higher qat price that is driven by the tax and a reduction in qat supply.

Trade competition policies

Generating competition in cereal import markets reduces domestic prices for cereals. The oligopolistic structure of cereal importers has led to the general perception that more competition is needed to reduce local cereal prices. Results from a simple comparison of local retail prices in selected markets in Yemen and international prices support this perception. Almost irrespective of the location of the markets, wheat prices in Yemen are on average twice as high as the average international price. While part of the margin is explained by the usual trade margin (including freight costs, storage, local transport, etc.), there is wide suspicion that the oligopolistic structure of cereal imports extracts additional rents. Improving competition may therefore make a contribution to food security.

In fact, improving trade competitiveness supports food security by raising real household incomes. Most households in Yemen are net consumers of cereals and therefore results of the Food Security Model show that the overall effect of more competition on households is positive. Household food security improves by 1 percentage point. Rural nonfarm households especially benefit from lower prices, given the high share of cereals in their consumption basket. Even farm households benefit from lower prices despite the reduction in agricultural output. This is because the large majority of farm households are net cereals buyers. In conclusion, creating competition amongst importers that lowers cereal prices can contribute to food security in Yemen. While this could be achieved at low fiscal cost, it will require appropriate legislation that is enforced decisively.

Population growth control

To address the key challenge of continued high population growth, Yemen can learn from successful countries. One example is Iran, where by the late 1980s rapid population growth was finally identified as an obstacle to development. In addition, the Government realized that the costs of this growing population were going to go beyond its capacity to provide adequate food, education, housing, healthcare, and employment. The following national family planning program has drawn international attention because of its innovative structure. The program encouraged women to wait 3 to 4 years between pregnancies, discouraging childbearing for women younger than 18 or older than 35, and limiting family size to three children. In addition, a national family planning law was passed that encouraged couples to have fewer children by restricting maternity leave benefits and withdrawing food coupons and social welfare subsidies after the third child. A nationwide campaign introduced contraceptives: pills, condoms, intrauterine devices, implants, tubal ligations, and vasectomies. Moreover, the law also called for several government ministries to incorporate information on population, family planning, and mother and child healthcare in curriculum materials. The Islamic Republic of Iran Broadcasting was entrusted with broadcasting such information and family planning was also integrated with primary healthcare. As a result, from 1986 to 2005, Iran's total fertility dropped from 7 children per women on average to 2, which is replacement-level fertility.

Reducing the population growth rate with Iran-style measures will also make an important contribution to food security in Yemen. Household food insecurity drops steadily over the whole period and reaches 20.9 percent in 2020, a reduction of more than 3 percent compared to the baseline. The main driver of the result is an increase of per capita food consumption across all household groups. The positive effects are largest for those households with the highest initial food insecurity and household size. Therefore, food security of rural nonfarm households improves most, followed by rural farm and urban households. The per capita calorie gap narrows from 348 to 319 kilocalories (kcal) under the population reduction scenario. Child malnutrition is also reduced; however, as in the case of previous scenarios, reducing child malnutrition will require additional programs that are well targeted to the children's needs.

Stimulation of remittances

Remittances are an important source of income for all groups, especially for rural food-insecure people. The average household receives about 8 percent of its annual per capita income from income transfers. The average share among the rural population and among the food insecure population is slightly higher (9 percent each). Remittances make up even 81 percent of the income transfers to the rural food insecure and 79 percent to the rural food secure. To a large extent, these income transfers are coming from family relatives in the Gulf States. This indicates that further increasing remittances, for example, through education programs and worker exchange programs with neighboring countries, can play an important role in improving food security. To show the effects of such programs, the scenario assumes that remittances will increase by 3 percent annually.

Raising household incomes by facilitating additional remittance flows further reduces food insecurity.

If remittances received by Yemeni households increase by 3 percent annually, food insecurity is estimated to be reduced by about 1.3 percentage points. However, sound macroeconomic management will be required given that inflows of foreign exchange can lead to an appreciation of the real exchange rate, which can negatively affect export sectors. The main beneficiary in terms of growth is the service sector, while manufacturing and agriculture see a slight decrease in output (relative to the baseline). This can partly be explained by the exchange rate effect, but also by the fact that additional household income is spent on goods that are imported rather than produced domestically. For these imported goods, the main value added occurs in Yemen's transportation and trade sectors.

Water sector reform

Water sector reform will be critical for improving food security and allow for accelerated and sustainable socioeconomic development. The availability of and the access to water is rapidly deteriorating in Yemen. The share of water used by the agricultural sector is projected to decline to about 60 percent of total water due to the rapid depletion of groundwater, the growing demand for drinking water, and to satisfy the water demand from economic growth in promising sectors, such as tourism, mining, and manufacturing. Water tables are falling by about 2 meters in Sana'a City and other parts of the country. While there is little doubt about the severity of the situation, estimating and modeling the water system in Yemen is severely constrained by data.

To address these challenges, Yemen has developed a National Water Sector Strategy and Investment Program (NWSSIP), which will complement the planned Food Security Strategy and contribute to improving food security. The successful management of reducing overall groundwater use and the redistribution of water from agriculture to other economic activities and human consumption will play a decisive role for Yemen's future food security. Recognizing the importance and urgency of this issue, Yemen has developed a comprehensive water strategy. The main pillars of this strategy related to policy can be summarized as follows:

- (1) Strengthen capacity for and implementation of integrated water resources management, including groundwater monitoring and control and water quality improvement
- (2) Manage the environmental impact of effluent and waste water in partnership with the private sector
- (3) Develop water resource and water use efficiency through the protection of user rights
- (4) Deliver efficient, low-cost projects on a demand-driven basis by enhancing project implementation efficiency, improved coordination, and decentralization
- (5) Strengthen institutions to play their role in promoting efficient water use
- (6) Enhance resource sustainability and quality through improved watershed management

4.2 Targeted Investments

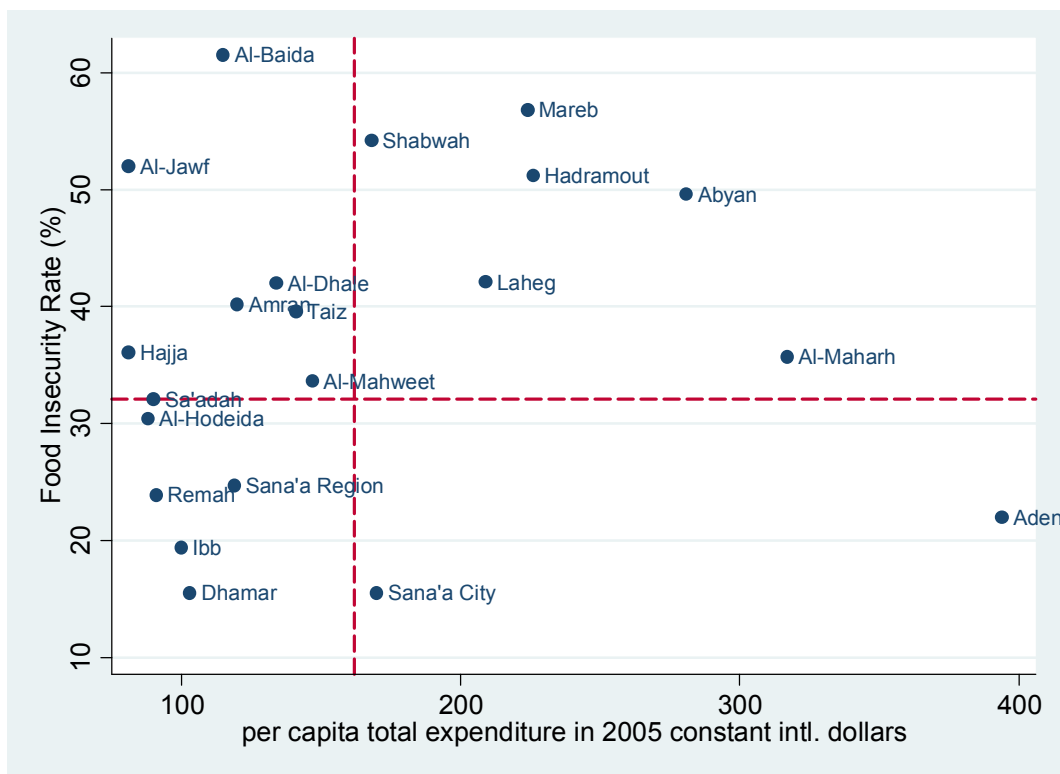
Not all food security goals can be reached by policy change only; importantly, the prevalence rate of child malnutrition remains unacceptably high. The previous section has shown that the proposed policies, both as single and combined options, are insufficient to fully reach the food security goals and to sharply reduce child malnutrition in particular. Additional measures are therefore required.

Distribution and targeting of public spending

Total spending on education, health and social transfers combined was less than spending on petroleum subsidies in recent years. Social protection remained especially low. Within the “economic affairs” category of the budget, which also includes industry, trade, transportation, communication, agriculture, fishery, among others, petroleum subsidies, made up 85 percent of the total in 2007. This share has increased dramatically over the past years, up from about 45 percent of total economic affairs expenditures in 1999 indicating that the fuel subsidy has crowded out investments in infrastructure, including transportation and telecommunication. Therefore, petroleum subsidies hamper long-term growth, economic diversification and poverty reduction. In Yemen, for example, road density, especially of asphalted roads, is generally low, so that the average travel time by district to the nearest urban center can exceed three hours.

Public spending across governorates does not seem to be aligned with food security levels, indicating low efficiency and targeting towards food security. Figure 4 compares the food security situation with per capita government expenditure at the governorate level. The horizontal dashed line gives the national average food security rate of 32.1 percent, and average per capita expenditure is marked with the vertical dashed line. Governorates with low per capita government expenditure and high food security are presented in the lower left quadrant, which includes Al-Hodeida, Dhamar, Ibb, Remah, and Sana’a Region. The upper left quadrant includes governorates that are food insecure with low government spending, namely: Al-Baida, Al-Jawf, Al-Mahweet, Al-Shale, Amran, Hajja, Sa’adah, and Taiz. Low spending may contribute to the food security issue in these regions. Governorates with high food insecurity and high public spending are positioned in the upper right quadrant. These governorates are worthy of special attention, as additional resources allocation did not generate expected outcomes of food security improvement. Governorates in this category include Abyan, Al-Maharh, Hadramount, Laheg, Mareb, and Shabwah. Sana’a City and Aden are located in the lower right quadrant, characterized by low food security and high government spending.

Figure 4. Relation of public spending and food security by governorate



Source: IFPRI based on CSO 2010^v.

However, it is not only the size and sector targeting of public spending that determines food security outcomes, the quality of spending also matters. There is a lot of scope for improving spending, which may be at least as important as scaling up of spending. Often, the provision of services is not satisfactory. Evaluations and monitoring on service provision quality and investment efficiency in all sectors will be needed for better outcomes.

Investments in infrastructure and basic public services

Road density, especially of asphalted roads, is generally low, so that the average travel time by district to the nearest urban center exceeds three hours. Food-insecure households generally need to travel 10-20 minutes longer to reach the nearest local market or urban center. Accordingly, estimation results show that investments into the road network system will improve food security. Expansion and upgrading of existing roads reduce travel time for consumers and farmers to local markets to buy and sell food that goes along with a reduction in transportation costs. Improvements of road infrastructure also ease people's access to public service facilities such as hospitals, schools, and administration offices, and have positive spill-over effects on development and commercialization in rural areas.

Upgrading 20,000 kilometers of feeder roads in the most food insecure districts and linking them to corridors, for example, will reduce more than half the travel time in these districts. More specifically, this upgrading, at an estimated cost of US\$1 billion, will improve people's physical access to local

markets (measured by a spatial access index) by about 124 percentage points. This translates into a reduction in the food insecurity rate by 1.6 percentage points. This drop includes only the direct effects resulting from an improved physical market access, but not the income effects. The positive spillover effects on economic growth and household incomes through income-earning opportunities and reductions in transportation cost are typically a multiple of the initial, direct effect. The resulting income growth in rural areas can be expected to significantly benefit the food insecure in rural areas.

Investing to expand drinking water supply

Access to clean drinking water affects people's nutritional status especially through its direct consumption and use for hygiene and food preparation. Lack of clean water access frequently results in diseases interfering with proper food digestion and nutrient absorption. Yemenis in rural areas (especially women and children) with no direct water access spend an average of 42 minutes per day fetching water from wells or surface water sources. About one-half of the Yemeni population and two-thirds in rural areas do not have a water supply in their house (water network or own well or tank) or on their door (water tank truck). Even in urban areas, more than 20 percent of households are not connected to a public, private, or cooperative water network, while the public network in many cities is inefficient and often short in water.

Improved access to water has a positive effect on the nutritional health of children (and other individuals) in both rural and urban areas. For example, reducing the average time of rural households to fetch water by 15 minutes leads to a reduction in the prevalence of child malnutrition (stunting) by 1.4 percentage points. This partly results from better hygiene and less illness. Additional positive results can be expected from the saved time for fetching water. Good water access can be associated with longer care-times of mothers for their children, higher enrollment rates of pupils, increased income-generation activities, and lower workloads for women and children.

Investing in food security risk management

To reduce Yemen's vulnerability to global food price shocks and climate-related disasters, appropriate risk management mechanisms are necessary. One option to enhance the availability of cereals during crises are physical grain reserves with the main function of helping the country's vulnerable population to better cope with food emergencies. For the emergency preparedness function of physical reserves, the target size for Yemen is estimated at about 314,000 tons. However, physical reserves involve several challenges and limitations that have to be considered very carefully: (1) Strategic grain reserves are not an appropriate instrument for solving chronic hunger. (2) The market distortions created by physical reserves need to be managed carefully. (3) The establishment, management, and operation of a grain reserve involve significant costs that can be a major burden for the national budget, especially if the reserve is used as a price policy instrument. (4) Well-functioning reserves require reliable and permanent information about real prices and quantities in local and international markets and their trends as well as about the probability of a necessary intervention. (5) Good management of reserves is critical to success and depends on transparent and accountable governance. Other options should be considered. A regional grain facility solution might therefore be a cost-efficient way to protect against

future food price shocks. Hedging in international markets can be a smart way to avoid issues related to physical storage options. Comprehensive cost and risk analyses are needed to evaluate these options against one other. A mix of options might be the preferred strategy.

The success of grain reserve programs can be increased by linking with other food security programs.

Coordination between grain reserve and other food security programs including NGO-run food aid, school feeding, and food-for-work programs is critical for both the efficiency of the grain reserve and the overall functioning of all food security programs in a country. A close coordination is particularly needed for an efficient targeting towards the most vulnerable people as well as for a continuous recycling of the stored grain to maintain its quality (and thus to prevent health risks to the beneficiaries from spoiled grains in cases of emergency).

Emphasis during food price crises must be on scaling up existing programs while investing in their improvements over time.

These include (i) cash payment to the needy people to help them cope with the food price emergency through community-based labor-intensive work programs, using the Social Fund for Development (SFD) as a funding mechanism; and (ii) the implementation of support and capacity-building measures for the Social Welfare Fund (SWF) to expand and improve the effectiveness of the national cash transfer safety net in order to further mitigate the adverse impact of high and more volatile prices on poverty.

Risk management should be combined with long-term development and food security goals.

Disaster management should become part of the overall economic development planning framework by recognizing the role of social transfers for building economic resilience among communities vulnerable to disasters, which are being implemented by the Social Welfare Fund, Social Fund for Development, Public Works Departments, international agencies and donors and include activities such as direct transfers, cash-for-work programs, community asset building through public works, assistance to undertake micro-enterprises and other productive activities and nutrition and health programs. Organizationally, the Food Security Committee should actively seek collaboration with entities working on disaster risk reduction and climate change.

Investing in basic public health

Access to basic public health services is poor nationwide, particularly in rural areas. While the average urban person reaches a hospital in less than one hour and any health facility (hospitals, health centers, health units) in less than 30 minutes, the average rural person needs more than double the travel time in both cases. Nationwide, about 3,400 health facilities are operating, of which about 10 percent are hospitals, 40 percent are health centers, and 50 percent are health units (mainly located in rural areas). However, rather than from the lack of coverage with physical infrastructure, the sector suffers from the poor quality of services; weaknesses include insufficient education of the workforce, especially in rural health centers and units; short operating hours of health centers and units; and lack of needed medication and inappropriate equipment available in the facilities. A consequence of the poor performance of the current health service is mistrust of the health workers in the public health facilities

(especially in rural areas), low willingness to pay for transportation to the health facilities, and a preference for costly health services provided by the private sector.

Key areas of investment include programs related to breastfeeding education, nutrition education, hygiene awareness building, family planning, birth after-care, and child growth-monitoring, in addition to the existing birth assistance and immunization programs. Currently, only 31 percent of all health facilities provide education on breastfeeding practices and 29 percent on nutrition, and only 13 percent of all health facilities have a child growth monitoring program. This also reflects a low coverage rate of these programs across the country and a long travel time to such specialized health facilities. On average, the travel time for these basic services exceeds 1.5 hours and is much higher in more remote districts, so that many households are lacking in proper access.

Thus, priority in health sector investments should be given to upgrading existing health units and centers and expanding basic health programs such as breastfeeding and nutrition education and child growth-monitoring. For example, the expansion of breastfeeding education, nutrition education, and child growth monitoring programs to all existing health facilities leads to a reduction in child malnutrition by 2.5, 2.4, and 3 percentage points, respectively. In addition to the provision of adequate equipment and medication, training of the health workforce and particularly extending their numbers in rural areas is urgently needed. Yemen, the same as Djibouti, has the lowest density of nursing and midwifery personnel in the MENA region. Achieving a density of two specialists per 1,000 people or tripling their current number within the next decade (i.e., about the current level of Algeria and Turkey) should serve as benchmark.

International experience confirms these findings and underlines the importance of health services for food security, especially women's health. One strategy is to invest in women's health and nutrition throughout their life cycle and to empower women to seek better care for themselves and their children. Women's health and nutritional status is important for both the quality of their lives and the survival and healthy development of their children. Direct actions to improve women's health and nutrition complement the struggle to achieve the long-term goals of gender equity and women's empowerment. Action must focus on: Intake of both macro- and micronutrients, particularly iron; energy intake and energy expenditure; disease prevention; and above all, strengthening the capacity for and practice of caring for women and adolescent girls. In addition, access to credit for women, is often critical for access to quality health services and other services and institutions.

Investing in basic public education

Lack of nutrition and health-related knowledge and formal education is a major cause of a poor nutrition. For the nutritional status of children and of the remaining household members, the educational status and nutritional knowledge of women and girls (who are typically responsible for meal preparation in the household) is critical. General knowledge and awareness of nutrition, health, and hygiene-related issues usually increases with the years of schooling. Nationwide, the average Yemeni mothers spends only two years in school (and does not achieve any educational certificate level), while 60 percent do not attend school at all. There is a large urban-rural disparity in formal education, albeit at

a generally low level; the average number of years in school for mothers in urban areas is almost five times higher than that of rural mothers.

Formal education has a direct, positive effect on child nutrition. For example, increasing the average number of years in school by five results in a reduction of child malnutrition by 4 percentage points on average. This effect captures only the benefit of generally improved education, but not the positive effects on women's income-earning opportunities and additional household income generation as well as other positive externalities of a higher-educated female population, including reduced population growth. Moreover, pupils' nutrition and health-related knowledge can be improved by specific teaching programs and practical courses in school. **Thus, also from a public nutrition and national food security perspective, compulsory school attendance and free basic education is beneficial and advisable.** Making primary school attendance compulsory (i.e., up to grade level of five successful schooling years) directly reduces child malnutrition by 3 percentage points nationwide.

4.3 Smart programs and awareness-building campaigns

Information and awareness-building campaigns are particularly required in five areas that are essentially interlinked: (1) family planning (2) qat consumption (3) breastfeeding practices (4) healthy nutrition, and (5) women's empowerment.

Yemen's rapid population growth and its resulting negative effect on economic development and food security call for large-scale family planning campaigns. In addition to the traditional topics of family planning, campaigns should also amplify the economic challenges of raising many children. Estimation results reveal that children in households with high shares of dependent people (children and elderly) are significantly less well-nourished, independent of the level of household income. This might be a result of a lower attention and care that can be devoted to the fewer children. A reduction of the average household size by two dependent household members reduces child malnutrition by 3.1 percentage points on average, without taking the positive per capita income effect into account.

Qat consumption negatively affects the nutritional health status of young children. For example, in urban areas, an average reduction of qat expenditure by 5 percentage points leads to a reduction of child malnutrition by 1 percentage point, without considering the positive effects resulting from the additional household income. The following issues of qat consumption need to be emphasized:

- High household expenses for qat consumption and the related underspending on children
- Reduction in people's productivity related to qat consumption
- Opportunity costs of buying and consuming qat
- Interfering effects between qat consumption and good nutritional health in individuals through loss of appetite
- Potential malabsorption of essential micronutrients such as iron and zinc
- Negative impact on child development through reduced child attention and care

- Potentially inappropriate feeding practices of children if households' food consumption follows their adult (male) food needs
- Health hazards for consumers including gum and stomach cancer and associated health costs

Promotion of adequate breastfeeding is critical for the healthy nutrition of infants and young children.

Education is particularly needed on the benefits of breastfeeding for child development. There are widespread misconceptions related to breastfeeding and proper breastfeeding practices in Yemen. Reference should be also made to the adverse effect of qat consumption in the breastfeeding period on child development.

Nutritional education programs need to cover a wide range of topics that devote attention to dietary diversity and micronutrient malnutrition. The lack of consuming diversified diets adequately enriched with vegetables, fruits, meat, and fish is the main cause of micronutrient deficiencies. The fact that diets are also poorly diversified in wealthy Yemeni households suggests that micronutrient malnutrition is not only a phenomenon of poverty but likely a consequence of poor nutritional knowledge. Similar to child malnutrition, micronutrient deficiencies are associated with high economic costs in the long term that can easily exceed 3 percent of the national GDP.

Improving women's educational attainment, economic participation, health status and empowerment in key for achieving the food security goals. More effort is needed to raise awareness of the central role of women for food security and household nutrition, and to unleash women's potential. Therefore, improvements of girls' education need to be prioritized. Changing attitudes on girls' schooling among parents, teachers, and principals will require long-term efforts. To this end, training staff and reviewing and revising school curricula play important roles in ensuring that gender stereotypes are not perpetuated in the classroom. Schools also need to be safe places for children, especially girls, to learn. It is important to work at the policy level, and with teachers and parents to ensure that both the school and the route to school are free from violence in all its forms so that girls can enroll in and complete a course of high-quality education while attaining the best possible grades.

Information and awareness-building campaigns are highly cost-effective. Experience from other countries shows that these investments have high rates of return. Close collaboration between government agencies and NGOs can help to reduce public expenditure and allows for "buying-in" of expertise. In addition to the usual way of reaching the most malnourished and food-insecure population (e.g., sending out trained, local field workers), innovative channels need to be explored that achieve a high coverage at moderate costs. Besides the media channels such as television and radio, the religious leaders and the Friday prayer in particular are important channels to consider. A constant flow of information and knowledge is mandatory for changing people's behavior. The population penetrated by information and awareness-building campaigns should go beyond the typical target population, which is usually women, particularly young mothers and girls. It is important to involve men, especially the household heads, into campaigns because of their decision power in allocating household resources and their leading role in Yemen's male-dominated society.

5 7-Point Action Plan

Yemen is the most food insecure country in the Arab world and among the 10 least food secure countries globally. In response to this alarming situation, the Government of Yemen, under the leadership of the Ministry of Planning and International Cooperation (MOPIC), developed a joint vision on food security: all Yemeni people should have access to sufficient and nutritious food at all times to live an active, productive and healthy life—i.e. food security for all Yemenis.

To translate this vision into action, the National Food Security Committee has formulated a set of concrete goals as a yardstick against which success in implementing the National Food Security Strategy can be measured. These goals are:

- (1) To cut food insecurity by one-third by 2015
- (2) To make 90 percent of the population food secure by 2020
- (3) To reduce child malnutrition by at least one percentage point per year

If it does not take action, Yemen will almost certainly miss these goals and the absolute number of food insecure people is projected to increase. Therefore, in a consultative process involving major government agencies, civil society, and international partners, the Food Security Committee identified 18 priority areas for action. Drawing on these priority areas, and based on results from the Yemen Food Security model, a set of seven actions has been prioritized as the core for the implementation of the Strategy.

If this 7-Point Action Plan is implemented decisively, Yemen will reach all three of its food security goals and become a food secure country by 2020. The required actions are as follows:

1. Leverage the fuel subsidy reform to promote food security

The Government of Yemen made a first step to reform petroleum subsidies by increasing fuel prices in 2010. Continuing this reform process offers a great opportunity for improving food security, if the transition to higher fuel prices is designed properly to make it pro-food secure. Simply phasing out the fuel subsidy would increase food insecurity, as farmers and the urban food insecure are most affected by higher fuel prices. However, the budgetary savings from reform provide ample fiscal space for complimentary measures to improve food security. These savings should be used to finance a combination of direct transfers and productivity-enhancing investments. Scaling up direct transfers targeted to the food insecure will help alleviate negative effects during the initial years of reform, and the Social Welfare Fund with its new targeting system will be crucial for implementing income transfers. To foster sustainable food security in the medium to long run, however, direct transfer payments will have to be complemented by public investments. Public investments in infrastructure related to utilities, transport, trade and construction integrate economic spaces and create a platform for restructuring agricultural, industrial and service value chains, which could be exploited by enabling domestic and foreign private investment in the medium term.

2. Improve the business climate to foster pro-food secure private investments in promising sectors

Policymakers can make an important contribution to facilitate private sector-driven pro-food secure growth by improving the investment climate for both domestic and international investors. Improvements in the business climate are especially needed in access to credit, protection of investors, and the tax regime to unleash private sector-driven growth. While foreign direct investments are largely concentrated in the hydrocarbon sectors (oil and gas), it is important to attract investors in nonhydrocarbon sectors. These sectors usually have more linkages with the rest of economy, create more jobs, and employ more food insecure people. FDI inflows also come with new technology and fresh market opportunities to create a more productive labor force and enhance management skills. Investors should be especially encouraged to invest in rural areas. Many promising sectors such as mining, food processing, and tourism have the potential to generate employment in rural areas, thus helping the poorest escape food insecurity. However, the food insecure are often unable to participate in the labor market or do not possess the right skills to reap the benefits of growth: important issues that will require additional programs as discussed under point 7.

3. Use qat reduction policies for fostering agricultural development

Agriculture can make an important contribution to rural development and food security, especially by generating income and jobs. The major constraint for agricultural growth, however, is water; thus sharply reducing qat consumption (which consumes 40-50 percent of the country's water resources) is vital for reaching nonqat agricultural growth and Yemen's food security goals. However, measures to reduce qat consumption may meet sharp resistance from the Yemeni people. Therefore policy measures will require a communication campaign to provide comprehensive information on their urgency and necessity. Policymakers must serve as good examples and abstain from consuming qat and should consider additional measures for discouraging qat consumption. The introduction of a consumption tax on qat could kill two birds with one stone. It discourages people from excessive consumption *and* generates additional revenues for the government. These tax revenues should be invested in agriculture and used for the promotion of alternatives to qat production, such as cereals and coffee production, and marketing. If this "qat reduction for agricultural development strategy" is implemented properly, farmers will be more than compensated for the loss of qat revenues, and Yemen's food security will improve.

4. Improve food security risk management

To reduce Yemen's vulnerability to global food price shocks and disasters, appropriate risk management mechanisms are necessary. First, effective risk management will require improvements in the food import regime and of existing mechanisms to protect the most vulnerable from shocks. The oligopolistic structure of the cereal import market, dominated by a small number of importers, increases local prices for cereals even during non-crisis years. Creating more competition among food importers by introducing appropriate laws and regulations will make an important contribution to improving food security. Second, the Government should consider building physical grain reserves for emergency situations, such as the 2007-08 global food crises. However, it is most important to note that physical

reserves involve several key challenges that have to be considered very carefully, including potential market distortion, high management costs, and issues of bad governance. Regional grain facilities might be a cost-efficient alternative to protect against future food price shocks, and hedging in international markets can be a smart way to avoid issues related to physical storage options. For any type of price risk management, an effective market price monitoring system will be critical for effective decisionmaking. Third, the Government should use the political opportunities that arise from food price crises and disasters to increase long-term food security and development, by incorporating risk management into the overall economic development planning framework. Government should also recognize the role of social transfers for building economic resilience among vulnerable communities should be recognized, including activities such as direct transfers, cash-for-work programs, community asset building through public works, assistance to undertake micro-enterprises and other productive activities and nutrition and health programs. Strong collaboration between agencies such as the Food Security Committee, the National Disaster Management Unit (NDMU) working under the Civil Defense Higher Council, and Yemen's international partners is absolutely essential for success.

5. Implement the water sector strategy decisively

Water sector reform is crucial for achieving Yemen's food security goals and sustaining accelerated development. The successful management of the reduction of overall groundwater use and its redistribution from agriculture to other economic activities and human consumption will play a decisive role for Yemen's future food security. Important pillars towards efficient and sustainable water management are: (1) to strengthen capacity and implementation for integrated water resources management, including capacity development, groundwater monitoring and control, and water quality improvement; (2) to manage environmental impacts, including environmental protection and partnership building with the private sector on effluent and waste water; (3) to develop water resource and water use efficiency by protecting user rights; (4) to deliver efficient, low cost projects on a demand-driven basis by enhancing the efficiency of project implementation, improving coordination, and decentralizing; (5) to strengthen institutions to allow them to play their role in promoting efficient water use; and (6) to enhance resource sustainability and quality through improved watershed management.

6. Better target public investment and improve service provision, especially in rural areas

In recent years, Yemen has spent more on petroleum subsidies than on education, health, and social transfers combined, and, compared with other MENA countries, it under-spends on infrastructure, agriculture, and health. From a spatial perspective, public spending across governorates does not seem to be aligned with food security levels, indicating low efficiency and targeting. Better aligning public investments with Yemen's development objectives in general and food security strategy in particular across sectors and governorates will require a comprehensive public investment review. It is not only the size and sector targeting of public spending but also the quality of spending that determines food security outcomes. There is a lot of scope for improved spending, which may be at least as important as scaling up spending. Often, physical infrastructure exists but the services provided are not satisfactory. Evaluation and monitoring of service provision quality and investment efficiency in all sectors will be

needed for better outcomes. However, additional investment is also required, particularly to upgrade the rural drinking water supply and rural roads. Key services to target include programs related to breastfeeding education, nutrition education, hygiene awareness building, family planning, birth after-care, and child growth monitoring, in addition to existing birth assistance and immunization services.

7. Launch high-level awareness campaigns for family planning, healthy nutrition, and women’s empowerment

The Yemeni Government should launch three national campaigns at highest political level, for example, as “presidential campaigns.” First, a national family planning program should be implemented, for which Iran’s national family planning program can serve as a model in its design and implementation. Such a program should be strongly integrated with primary healthcare and should involve religious leaders. Second, a high-level campaign should be launched to address the lack of nutrition and health-related knowledge among Yemenis. This nutritional education program should cover a wide range of topics, including dietary diversity and micronutrient malnutrition. The third high-level campaign should focus on the acceleration of women’s empowerment. The evidence clearly shows that gender inequality goes hand in hand with malnutrition. This points to a clear avenue for reducing malnutrition and speeding up economic development in Yemen: improving women’s educational attainment, economic participation, health status, and political empowerment.

If this 7-Point Action plan is implemented, Yemen can reach its food security goals by 2015 and 2020, respectively. Given the NFSSP’s comprehensive nature, this Strategy may become the “mother of all strategies” and make an important contribution to Yemen’s development policies over the next decade. However, it is important that policymakers now quickly move from stating goals and defining actions to making the required policy reforms and designing the specific investment plans and programs to implement the 7-Point Action Plan. In addition, the implementation of the policies, investments, and programs proposed in this Strategy are likely to be most effective when conducted in a transparent and inclusive manner with effective follow-up, an evidence-based decisionmaking process, and appropriate monitoring and evaluation mechanisms. It will require an appropriate institutional design and significant efforts to strengthen capacities in all ministries involved. Perhaps most importantly, successful implementation will command decisive leadership and the commitment of all key ministries to collaborate toward making the food security vision for Yemen a reality.

ⁱ The National Food Security Strategy Papers are available upon request from MOPIC (fsspmpic@gmail.com) or IFPRI (c.breisinger@cgiar.org).

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ⁱⁱⁱ World Bank 2009. World Development Indicators.

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