LEVERAGING AGRICULTURE FOR IMPROVING NUTRITION & HEALTH

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GROWTH IS GOOD, BUT IS NOT ENOUGH TO IMPROVE NUTRITION

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While it is generally agreed that growth is a necessary precondition for reducing poverty, relatively little is known about the relationship between economic growth and nutrition and, hence, how economic policies can be leveraged to improve nutrition. This brief argues that growth is good, but is not enough to improve nutrition. During the early stages of development, growth helps reduce the prevalence of calorie deficiency, and, in most countries, agricultural growth plays a key role. But malnutrition becomes less responsive to growth as its prevalence rate declines, so economic diversification into the manufacturing and service sectors becomes necessary to leverage further reductions in malnutrition, especially as people migrate into urban areas. Nevertheless, growth—whether driven by the agriculture or nonagriculture sectors—is insufficient to address child malnutrition and reduce micronutrient malnutrition in all their dimensions. Strategic investments and special programs are needed in the complementary sectors of health and education as well.

These findings are based on cross-country analyses that explore the general relationship between growth and malnutrition in the process of development. To complement these findings, forward-looking economic modeling applied to an agriculture-based economy (Malawi) and an oil-based economy (Yemen) assess the impacts of alternative policies on growth and nutrition outcomes. The conceptual framework underlying the country-specific economic analyses is displayed below (see Box 1).

Cross-Country Analyses

Growth is good for nutrition, but the plotted graphs in Figures 1 and 2 show that some countries significantly deviate from the general growth–nutrition path. While some countries have been successful in leveraging growth for improved nutrition outcomes others have seen nutrition actually deteriorate despite growth. So, in what way and to what extent does growth contribute to nutrition outcomes, and, how can policies be designed to better leverage growth for nutrition improvements? To answer these questions, the authors conducted two country case studies.

Complementary Case Studies: Malawi and Yemen

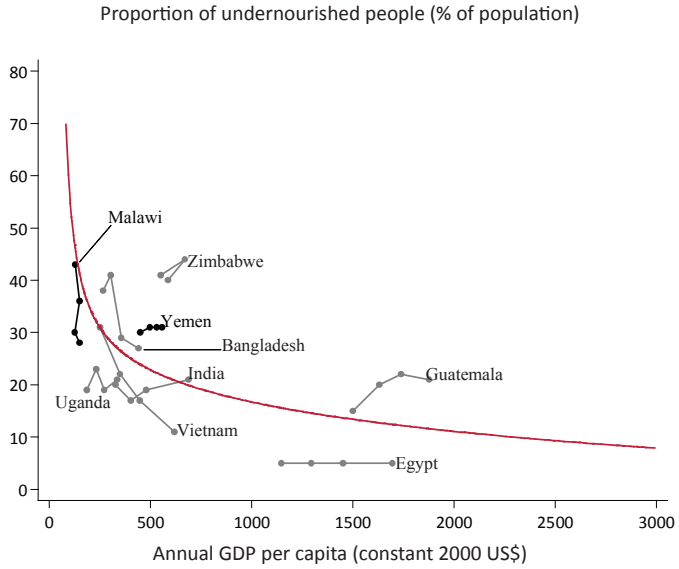
Malawi and Yemen are both low-income countries with high levels of malnutrition. Malawi's economy is agriculture-based and features limited economic diversity whereas Yemen has an oil-based economy and a relatively small agriculture sector. The nature of the nutrition challenge in the two countries is also inherently different. In Malawi, micronutrient deficiencies—especially in iron, zinc, vitamin A, and folate—are of particular concern; in Yemen, child malnutrition is extremely widespread in alarmingly severe forms. By capturing a broad range of nutritional challenges, these case studies illustrate country-specific issues while simultaneously providing important general policy lessons on the linkages between agricultural and nonagricultural growth and nutrition outcomes, especially for countries in Africa and the Middle East.

For each of the case studies, three different policy scenarios were explored. For Yemen, the three scenarios, simulated for 2010–2020, are (1) a baseline scenario reflecting the growth patterns of the recent past; (2) an agricultural reform scenario under which reform aims to accelerate agricultural growth and increase agricultural output for rural

Box 1 — Methodology and Conceptual Framework

By combining macroeconomic factors with sector and households issues, the new conceptual framework underlying this brief expands on the common perspective of food security as primarily a household-level problem. It explicitly accounts for the role of sectors that are most relevant to improving people's nutritional status: agriculture, trade and infrastructure, and health and education. In this way, the framework emphasizes the need for an integrated, cross-sector approach to improving nutrition, and includes the major pathways through which policies and external shocks (such as food price crises) translate into nutrition outcomes. This framework is applied by linking economywide, dynamic computable general equilibrium models with household and child nutrition simulation models to enable the effects of sector-level economic growth and policies affecting people's nutritional status to be estimated consistently. The resulting findings offer evidence of the potential impacts of policies under different conditions, ultimately having implications for policy choices and priorities.

Figure 1 — Relationship between undernourishment and GDP



Source: Constructed by authors based on FAO and World Bank data. See conference paper cited below.

income generation, thereby improving food security; and (3) a promising sector growth path that promotes growth in the manufacturing and service sectors (see Table 1).

For Malawi, the period of high agricultural growth experienced between 2005 and 2010—due almost entirely to rapid maize yield improvements under the Farm Input Subsidy Program (FISP)—was replicated. For the forward-looking period (2010–2020), two further scenarios are modeled, namely (1) a return to the more moderate long-term growth rate experienced prior to the introduction of FISP, a scenario based on the assumption that Malawi will not be able to maintain the maize-led growth momentum generated under FISP; and (2) a broad-based agricultural growth path in which it is assumed that Malawi maintains its growth momentum through rapid diversification of the agriculture sector under the Agricultural Sector-Wide Approach (ASWAp) currently being implemented (Table 2).

Results and Associated Policy Implications

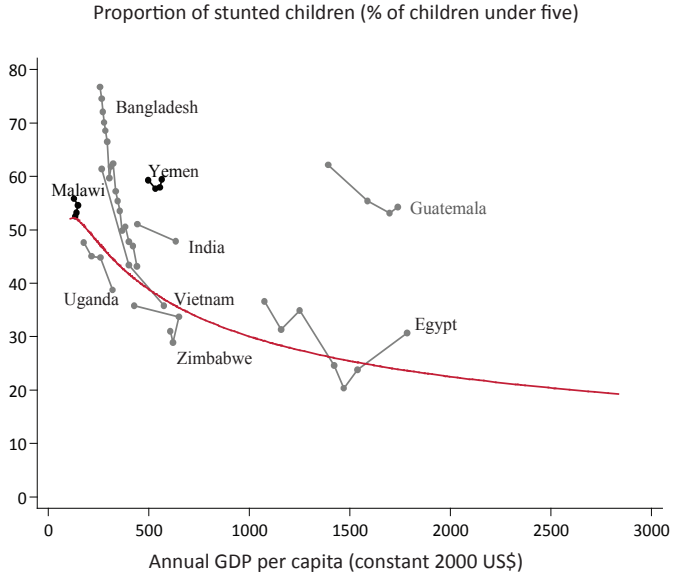
The cross-country analyses revealed four major findings. First, growth is of primary importance in reducing undernourishment. Second, the nutritional impact of growth declines as the development process evolves. Third, especially at early stages of a country's development, agricultural growth is critical for reducing undernourishment, indicating that the structure of growth matters for nutrition outcomes. Fourth, malnutrition among young children—an important dimension of overall nutrition—seems to be highly unresponsive to economic growth, which indicates an important difference from the relationship between growth and poverty.

The case studies confirm that growth leads to significantly reduced calorie deficiency in general. In Yemen, under both the agricultural reform scenario, and the promising sector growth scenario the prevalence of calorie deficiency falls below baseline levels, with the result that the number of calorie-deficient people in 2020 will be lower than that of 2009. In Malawi, even a return to the long-term growth trends in 2010–2020 leads to further declines in calorie deficiency.

Depending on the country's economic structure and characteristics of its malnourished people, agricultural or nonagricultural growth can be better for improving nutrition. In Malawi, agriculture has a strong potential to contribute to the reduction of malnutrition. This outcome holds for most agriculture-based economies, where agriculture contributes a main share to the national income, and the majority of poor people derive their living from farming. Under these circumstances, nutrition outcomes improve not only among rural households, but also among urban ones, mainly through reduced food prices and economic linkage effects (both of which increase real incomes). In Yemen, growth led by the industry and service sectors is more beneficial for improving nutrition outcomes than agriculture growth. The effects of agriculture growth on malnutrition are limited in Yemen because the majority of the population draws its income from nonagricultural activities, and farmers are not the most malnourished population group. In addition, most foods—especially staples—are imported, so the net consumer benefit accruing from the local price effect of agricultural productivity growth is low.

The role of growth in improving nutrition shifts during the development process. Comparisons between the broad-based agricultural growth and baseline scenarios in the Malawian study reveal that calorie and micronutrient deficiencies become less responsive to growth as prevalence rates decline, at which time economic diversification is needed to leverage further reductions. Thus, this result supports and extends the

Figure 2 — Relationship between child malnutrition and GDP



Source: Constructed by authors based on FAO and World Bank data. See conference paper cited below.

Table 1 — Summary of policy scenarios, Yemen case study

	1. Baseline scenario			2. Agricultural policy reform			3. Promising sector growth		
Yemen	**2009**	**2015**	**2020**	**2009**	**2015**	**2020**	**2009**	**2015**	**2020**
Growth (%)									
National GDP	6.6	3.9	3.6	6.6	4.8	4.4	6.6	7.1	7.0
Agriculture	5.1	2.6	2.1	5.1	4.1	4.3	5.1	3.5	2.8
Industry	11.2	6.4	4.5	11.2	7.7	5.6	11.2	10.7	9.3
Services	6.3	5.1	4.7	6.3	6.0	5.4	6.3	8.8	8.0
Malnutrition									
Proportion of calorie-deficient people (%)	32.1	25.3	24.3	32.1	24.1	21.9	32.1	20.4	15.2
Rural	37.3	31.0	29.7	37.3	29.4	26.6	37.3	24.9	18.5
Farm	33.4	26.7	25.4	33.4	23.2	18.8	33.4	21.0	14.0
Nonfarm	39.2	33.0	31.8	39.2	32.4	30.3	39.2	26.8	20.7
Urban	17.8	9.7	9.3	17.8	9.4	8.9	17.8	7.8	6.1
No. of calorie-deficient people (millions)	7.48	7.04	7.83	7.48		6.70	7.48	5.67	4.90
Proportion of stunted children under five (%)	59.4	58.1	57.8	59.4	57.9	57.5	59.4	57.0	55.3
Rural	63.4	62.3	61.9	63.4	61.9	61.6	63.4	61.2	59.7
Urban	47.9	46.3	46.0	47.9	46.1	45.6	47.9	44.7	42.5

Source: Constructed by authors.

Table 2 — Summary of policy scenarios, Malawi case study

	1. Past maize-led growth path		2. Return to long-term growth		3. Broad-based agricultural growth	
Malawi	**2004**	**2010**	**2015**	**2020**	**2015**	**2020**
Growth (%)						
National GDP	6.8	5.9	4.0	4.1	6.4	6.0
Agriculture	8.5	6.0	3.3	3.4	6.5	5.1
Cereals	17.3	8.3	3.0	3.0	8.9	4.4
Export crops	4.9	5.5	4.1	4.0	5.2	7.7
Mining and industry	5.4	5.5	4.6	4.5	6.2	6.8
Construction and services	5.7	5.9	4.6	4.6	6.3	6.8
Malnutrition						
Proportion of deficient people (%)						
Calories	34.8	17.1	10.3	5.9	8.1	3.5
Iron	47.1	27.0	17.1	10.8	14.3	6.6
Zinc	54.5	32.8	20.8	12.9	16.9	7.9
Vitamin A	65.6	56.5	50.6	44.8	48.0	39.5
Folate	37.3	22.7	16.0	10.4	13.4	6.5
No. of deficient people (millions)						
Calories	4.46	2.67	1.88	1.27	1.48	0.74
Iron	6.04	4.21	3.13	2.32	2.62	1.42
Zinc	6.99	5.11	3.81	2.78	3.09	1.71
Vitamin A	8.41	8.81	9.26	9.63	8.79	8.49
Folate	4.79	3.54	2.93	2.23	2.46	1.39

Source: Constructed by authors.

finding from the Yemen study indicating that the structure of growth across the whole economy and within the sectors is important for improving people's nutritional status in terms of calories *and* micronutrients (see Box 2).

Neither agricultural growth nor nonagricultural growth is sufficient to improve child nutrition and reduce micronutrient malnutrition as a whole. Results from the country analyses indicate that cross-country differences are more pronounced for the relationships between growth and child malnutrition than they are for the relationships between growth and undernourishment. For example, despite relatively low growth, Bangladesh has achieved impressive results in consistently reducing child malnutrition over time. In contrast, Egypt has experienced relatively high and steady growth over the past three decades with a low rate of poverty and undernourishment, but the prevalence of child malnutrition is largely unrelated and even returned to its early 1990s levels in recent years. Child malnutrition is less responsive to both overall growth and agricultural growth throughout the process of economic development, so that non-income related factors (such as information and knowledge) and individual health and healthcare seem to matter more in reducing child malnutrition than in reducing undernourishment, especially at later stages of development. This general finding is also confirmed by the results of the case studies. Even with decisive policy reform in Yemen resulting in rapid growth acceleration, child malnutrition remains at unacceptably high levels. In addition, despite reduced deficiencies in calories, iron, zinc, and folate, vitamin A deficiency in Malawi remains largely unresponsive to economic growth. Although the proportion of people with a vitamin A deficiency declined due to Malawi's rapidly growing population, the actual number of deficient people increased.

Consequently, policy reform supporting both agricultural and nonagricultural growth needs to be accompanied by strategic investments and targeted programs to tackle child malnutrition. Persistent, widespread child malnutrition globally and the low responsiveness of child nutrition to economic development are particularly alarming. Necessary actions include: (1) investments in infrastructure (especially to expand drinking-water networks), health, and education; (2) programs to improve child and maternal nutrition and health (for example, through birthing assistance and pre- and postnatal care); (3) education campaigns on child feeding practices (including breastfeeding), appropriate diets, proper hygiene, and disease and illness prevention and treatment; (4) child growth monitoring; (5) immunization campaigns; and (6) nutrient-supplementation programs. Actions to promote gender equality, women's empowerment, and family planning should also be taken. While the evidence shows that proposed investments and programs have high rates of return in the vast majority of cases, they require political will and financial resources, reinforcing the importance of increased revenues from growth.

Specific investments and programs are also needed to effectively reduce micronutrient malnutrition. Calorie deficiency and some micronutrient deficiencies decline in the process of economic development, but other micronutrient deficiencies are less responsive to growing incomes. Possible avenues for directly reducing these deficiencies

Box 2 — The Importance of Non-Income Measures in Evaluating Development Outcomes

In highlighting the absence of links between growth and certain dimensions of nutrition, the results of this study strongly support the use of non-income measurements (for example, nutrition and health status) to complement income-based measurements (for example, poverty) in evaluating development outcomes. The concepts of being "well-nourished" or "malnourished" are intuitive, and nutrition impacts can be more directly measured through anthropometric indicators. These indicators are typically provided for young children—the most vulnerable population group—and therefore consider distributional issues; they are not subject to arbitrary assumptions about costs and individual needs. An even stronger argument for advancing the role of nutrition in the development agenda is that malnutrition lowers productivity and has serious long-term consequences for development by limiting the physical and mental potential of people—particularly children—thereby limiting the development potential of future generations.

are programs that distribute nutrient supplements to the most deficient people, mass fortification of commonly consumed foods and condiments, and biofortification. More research investments are clearly needed to enable further exploration and utilization of the potentials of biofortification. Nonetheless, addressing the causes of micronutrient malnutrition inevitably requires programs that support dietary diversification by providing education on nutritious, well-balanced diets. Without this understanding, the nutritional impact of interventions that increase people's economic access to improved nutrition will be strictly limited. Measures that enhance people's direct access to fruits, vegetables, and animal products include programs promoting home and school gardens, small-scale livestock husbandry, and aquaculture. Investments in programs that improve people's health and hygiene are also necessary to reduce secondary malnutrition, which causes nutritional deficiencies through infection, illness, and disease.

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