



# Economic Impact Assessment of World Food Program Expenditures in East Africa

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The World Food Programme (WFP) spends more than USD 745 million annually in Regional Bureau of Nairobi (RBN) countries. In 2019, the RBN region moved 1.1 million MT of food throughout East Africa. It disbursed USD 270 million in cash to 5.4 million beneficiaries in the countries covered by RBN. It procured and supplied more than 500,000 MT of food from local, regional, and global sources. These numbers increased with the inclusion of Sudan in the RBN beginning in December 2020. This spending is vital to the humanitarian operations of the WFP. It also affects RBN economies, potentially creating large income and production impacts in the region.

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This project uses state-of-the-art economic modelling tools to estimate the broader economic impacts of WFP's expenditures in RBN countries and in the East Africa region as a whole. To achieve its food security and nutrition objectives, WFP operations spend large sums of money on food, logistics and other non-food goods and services in East Africa countries. This can stimulate production and incomes in the directly affected countries and activities. As the impacts of WFP operations work their way through the economy, they spread across households, businesses, and localities within countries as well as to other countries in the region, through trade. Because of this, the amount WFP spends represents only part of the impact of WFP spending in the region; there are also income, production, and trade spillovers, or secondary impacts. Our general equilibrium modelling approach captures the full impact of WFP spending, including direct impacts as well as the indirect spillover effects that WFP operations generate. We do not consider the impacts of cash disbursements to households, which would add to the multiplier effects of WFP operations.

This executive summary presents findings for each RBN country that has sufficient data to be included in the model. They include Ethiopia, Kenya, Rwanda, Uganda, Burundi, Djibouti, Eritrea, and Sudan. The remaining RBN countries are combined into the "Rest of Eastern Africa" (XEC) region, which includes South Sudan and Somalia. Unfortunately, the XEC region also includes a small number of small non-

RBN countries, including Comoros, Mayotte, and Seychelles.

The full report provides a detailed description of the approach, activities, and initial findings for each country and the region. It is important to note that the results presented here are from modelling WFP spending in each country as well as in the East Africa region as a whole. Because of this, they capture trade and other linkages that may create important feedback effects in the region. General equilibrium models of individual countries would not capture these linkages.

## Methodology

We used a multi-country model to assess WFP's economic footprint in East Africa, grounded in the Global Trade Analysis Project (GTAP) framework (Hertel 1997). It combines applied general equilibrium (AGE) models of individual countries within a larger, regional model. It is global, but it is also flexible enough to model impacts of WFP spending in individual countries as well as the East Africa region.

## Modelling Impacts of WFP Expenditures on Food

Figure 1 illustrates the strategy to evaluate the economic impacts of WFP's expenditures in the RBN region. The initial impact of WFP's expenditures in the region are on the vendors (wholesalers) who supply food and other goods and services to the RBN.

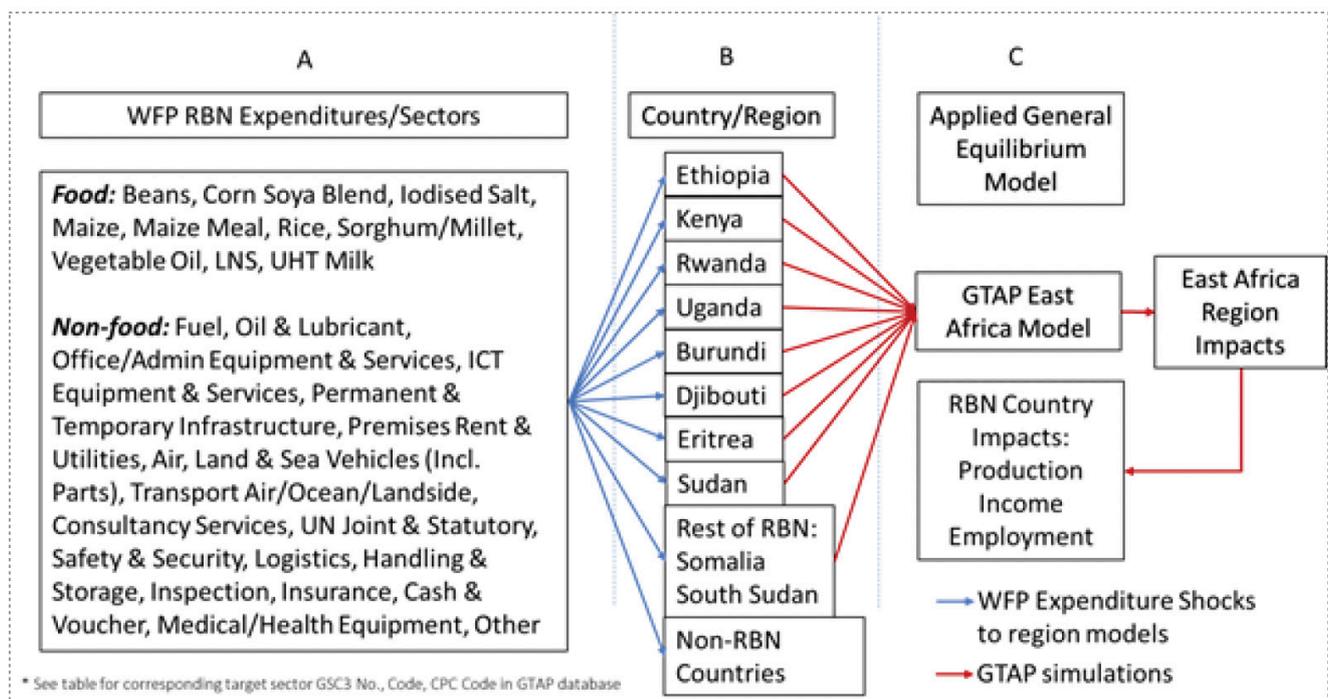


Figure 1. Modelling Impacts of WFP RBN Food Expenditures

Besides purchasing food, RBN operations spend on goods and services ranging from non-food services contracted through logistics to “office stationery to kitchen equipment for schools to materials and services for the construction of warehouses, roads and bridges” (WFP Supply Chain Annual Report 2015). These expenditures increase the demand for goods and services inside and outside the RBN region. Whereas food procurement creates income for food vendors and farmers, other spending spreads economic benefits across a wide range of production activities, benefiting businesses as well as input suppliers and workers.

RBN personnel worked with the research team to itemize all of these expenditures, by sector and vendor (see Panel A of Figure 1). A survey of WFP suppliers gathered information on where the vendors sourced each item they sold to the RBN. This made it possible to link each RBN expenditure to the affected production sectors (listed in Table 3) in each country (Panel B in Figure 1).

The RBN AGE model takes these country- and sector-specific expenditures and estimates their economy-wide impacts within each RBN country as well as across the East Africa region, using simulation techniques (Panel C).

## Findings

The WFP program is estimated to have spent a total of \$745 million in the RBN region in 2020. This



includes around \$63 million in Kenya, \$69 million in Ethiopia, \$9.5 million in Rwanda, \$18 million in Burundi, \$46 million in Djibouti, \$6.5 million in Eritrea, \$125 million in Sudan, \$73 million in Uganda, and \$355 million in the rest of the region. Most of this spending on purchases of domestic goods and services. The remainder is on imports from other RBN countries or the rest of the world. For example, roughly 75% of WFP spending in Kenya was on purchases of domestic goods and services, and the rest was on imports. Of the amount spent on imports, some 59% was sourced in Rwanda—mainly crops. Most of WFP's spending in the region was on crops and other food (44.3% of the total), transport (26.6%), and trade, including warehousing (10.4%; see Figure 2).

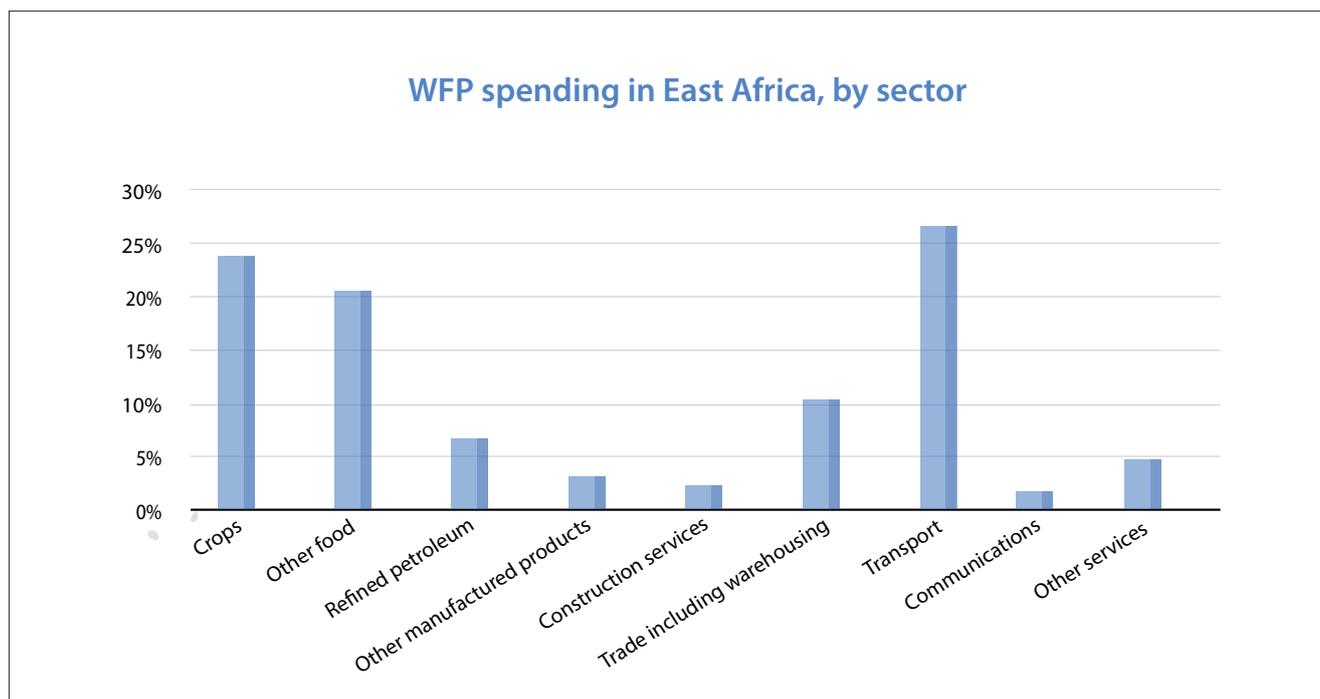


Figure 2. WFP spending is mostly on food, transport, and trade including warehousing



WFP spending, although impressive, is small compared with the size of entire national economies in the region. For example, the \$69 million that the WFP spent in Ethiopia is equivalent to less than 0.1% of Ethiopia's total GDP, which was \$82 billion in the reference year. Because WFP spending is small compared with the size of national economies, so are the total impacts of this spending compared to each country's total GDP. Despite this, each dollar of WFP spending can have a disproportionately large impact in East African economies, because of spillover effects. In theory, spillover effects can be positive or negative, depending on whether an economy has sufficient labor and capital to expand its production to meet the new demand created by WFP spending in the region.

We used the RBN general-equilibrium model to simulate the national and regional impacts of total WFP RBN spending on production, incomes, and employment. We allocated WFP expenditures in each RBN country to their corresponding production sector. The immediate impact of this spending is to stimulate demand for goods and services supplied by the directly affected sectors. As these sectors increase their output to meet WFP demand, they demand inputs from other sectors and generate income, in the form of payments to labour (wages) and capital (profits). This income flows into households, which in turn spend it,

creating additional rounds of impacts on production and income.

The study is intended to provide a basis for thinking about how WFP expenditures can affect income, production, and employment, and how the effects depend in important ways on what economies look like, in particular the availability of labor and capital to support increased production. The same expenditures can produce strikingly different outcomes in different economic settings. It is important to keep this in mind while assessing the regional impacts of WFP activities, whether they are local, national, or regional.

We ran our simulations under two sets of assumptions, or model "closure rules." The first assumes that labor and capital investment are available to fuel economic expansion. This is the most flexible set of assumptions, and it produces the most favourable outcomes. The second assumes that aggregate labor and capital supply are fixed, and wages and capital returns adjust to equate their respective demand and supply. This is the most restrictive set of closure assumptions. Without labor and capital to fuel economic expansion, WFP spending would compete with other spending in the economy to purchase goods and services.<sup>5</sup>

The reality is likely to fall somewhere in between these extremes, but it probably favours the more flexible case; this is our preferred scenario. Unemployment rates generally are high in East African countries. For example, the unemployment rate in Kenya averaged 9.93 percent from 1991 until 2020, suggesting that labor is available to support increases in production.<sup>6</sup> The availability of capital is less clear; however, traditionally at least some countries, including Kenya and Ethiopia, have been able to attract foreign capital to support economic growth. We ran the simulations under the preferred scenario but also report findings under the restrictive scenario, which underline the importance of labor and capital availability in shaping WFP's economic impacts.

## Production Impacts of WFP Spending

Under the preferred set of assumptions, in most countries total production expands more than the

<sup>5</sup> All economy-wide modeling requires establishing closure rules, which determine whether prices (or, in the case of labor, wages) or total supply are fixed in the economy. Where abundant labor is available, the demand for labor can increase without putting significant upward pressure on wages. New investments to fund capital expansion or excess capacity in the economy enables production to increase without being significantly inhibited by capital constraints.

<sup>6</sup> For unemployment estimates see Trading Economics; <https://tradingeconomics.com/kenya/unemployment-rate>.

amount of WFP spending, resulting in multipliers greater than 1.0 (see Figure 3). The largest production multipliers are in Kenya and Uganda. The production multiplier is 6.47 in Kenya and 6.02 in Uganda. It exceeds 2.0 in Sudan, Ethiopia, Rwanda, Burundi, Burundi, and it is positive but small in Djibouti (0.84) and the rest of the East Africa region, which includes South Sudan and Somalia (0.33). It is negative in

Eritrea (-3.87). Negative production multipliers indicate that most of the demand created by WFP spending comes from imports, and this together with competition among production sectors results in a negative overall production impact. The positive production multipliers in all other countries and in the region as a whole tell us that WFP spending results in a net gain in production, benefiting local producers.

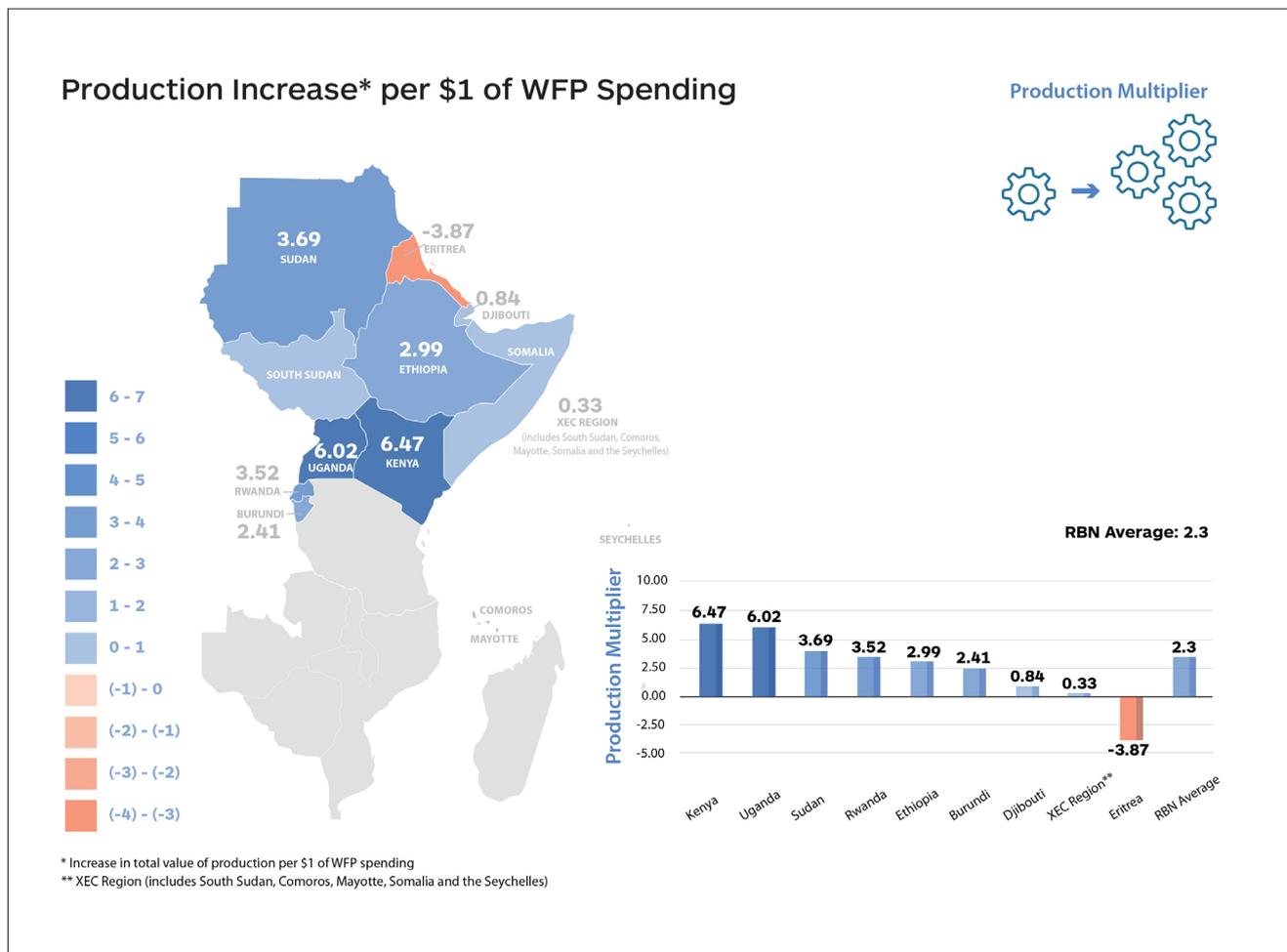


Figure 3. The production multiplier effects of WFP spending vary across countries.

## Real Income or GDP Multipliers

As production expands, income flows into households, stimulating consumption demand and additional rounds of production increases in the economy. Rising demand also can put upward pressure on the prices of goods and services. Price inflation raises consumption costs and creates the possibility that, even if cash income expands, real or inflation-adjusted income could fall.

Figure 4 shows the total real, or inflation-adjusted, increases in national real (inflation-adjusted) income per dollar of WFP spending in each country. These are calculated by dividing the effect of WFP

spending on total real GDP divided by the amount of WFP spending in each country. For the most part, real-income multipliers follow a pattern similar to production multipliers. An additional dollar of WFP spending raises total real income by \$3.68 in Uganda and \$3.36 in Kenya. The WFP income multiplier is 2.78 in Sudan, 2.47 in Rwanda, 1.82 in Ethiopia, and 1.4 in Burundi. It is small but positive in Djibouti (0.49) and in the rest of East Africa (0.15). The real income multiplier, like the production multiplier, is negative in Eritrea (-2.38). The positive real income multipliers in all other countries and in the region as a whole tell us that WFP spending results in a net income gain, benefiting local households.

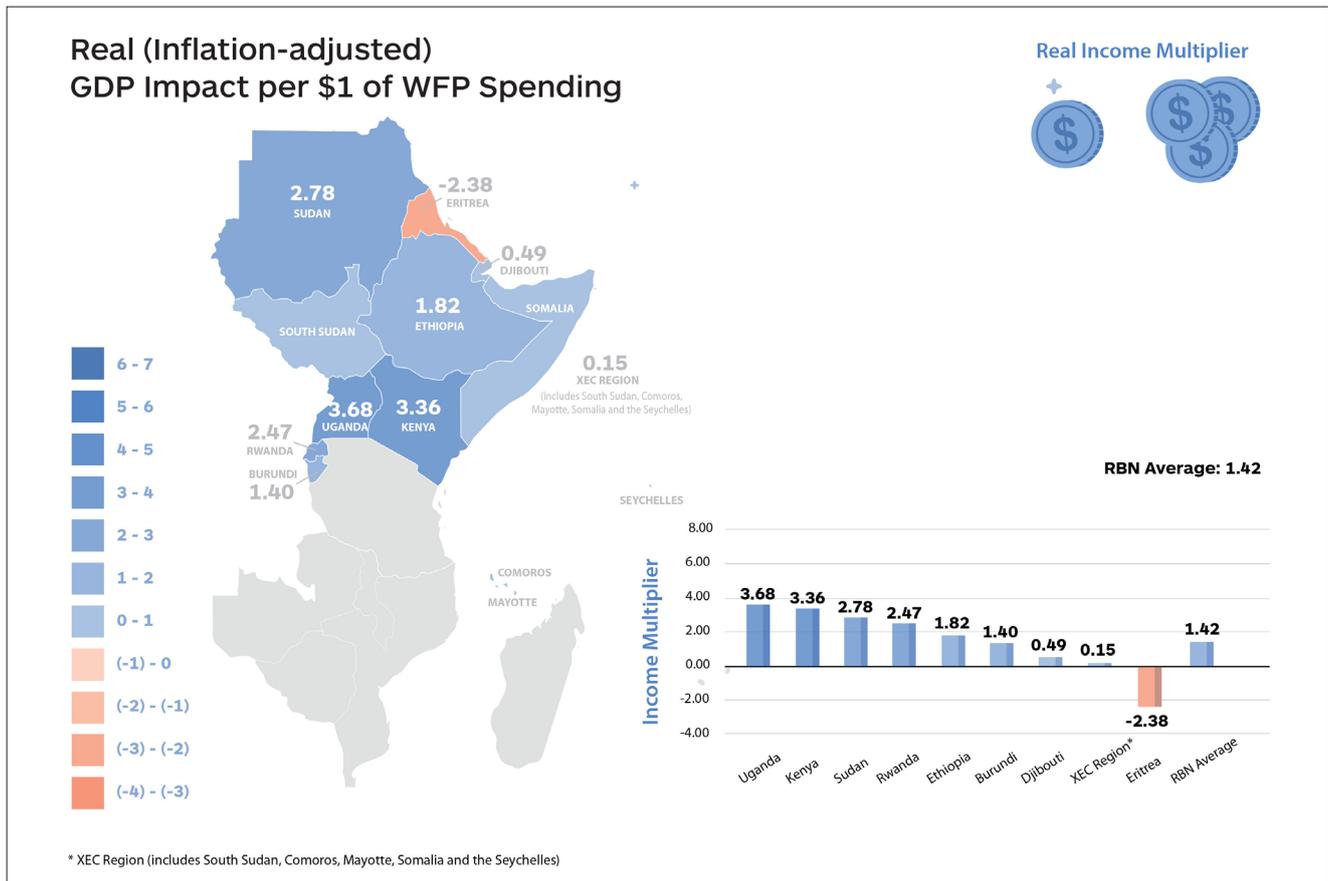


Figure 4. The multiplier effects on real GDP tend to be large where production multipliers are large.

## Employment Impacts of WFP Spending

Higher production creates jobs. Figure 5 shows the total employment effects of WFP spending in East Africa. These are calculated as the increase in total wage income divided by the average wage, then converted into year-round equivalent jobs.

Overall, WFP spending creates 365,606 jobs for unskilled workers and 20,047 jobs for skilled workers across East Africa. Impacts on unskilled employment are considerably larger than on skilled employment. The reason is that WFP spending impacts sectors that are likely to hire unskilled labor. Farming, transportation, trade, rely on farm labor, truckers, warehousing employees, and expand their hiring because of the direct and indirect impacts of WFP spending. The largest employment impact of WFP spending is in Uganda: 151,936 unskilled-worker jobs and 9,342 skilled-worker jobs. In the other countries, for unskilled employment, the positive impacts range from 1,642 in Djibouti to 73,145 in Ethiopia. Skilled employment expands by 167 in Djibouti to 4,219 in Kenya. Employment contracts slightly in Eritrea, where production and real income also fall: unskilled employment falls by 3,599, and skilled employment

by 296. In the rest of East Africa, employment increases by 13,987 for unskilled workers and 550 for skilled workers. The positive employment effects in the region tell us that WFP spending results in a net gain for workers.

It is clear from Figures 3-5 that the overall net effects of WFP spending in the RBN region are positive and large. Nevertheless, individual countries experience the impacts at different scales. In general, it appears that the most stable and productive countries benefit more, whereas the less stable countries and those relying heavily on imports benefit less or do not benefit.

## WFP's Economic Impacts Depend on Labor and Capital Availability

The impacts of WFP spending on production vary between the directly affected sectors and other sectors. They, along with real GDP and employment impacts, are also sensitive to whether or not labour in the economy is fixed ("Labour fixed") or in excess supply ("Labour free"). In an economy at full or near full employment, it may not be possible for the workforce to expand, though rising labor force participation could still offer some flexibility. If the supply of workers is unresponsive, production will

be constrained, and higher demand—stimulated by WFP spending or other sources—will tend to increase wages instead of employment. If capital is also at or near full utilization and new investments are not forthcoming, this will intensify the constraints on

economic expansion. In these constrained situations, it is not surprising to find that WFP spending has little or no effect on income and employment growth, and by pushing up prices, it could even provoke a decrease in real or inflation-adjusted incomes.

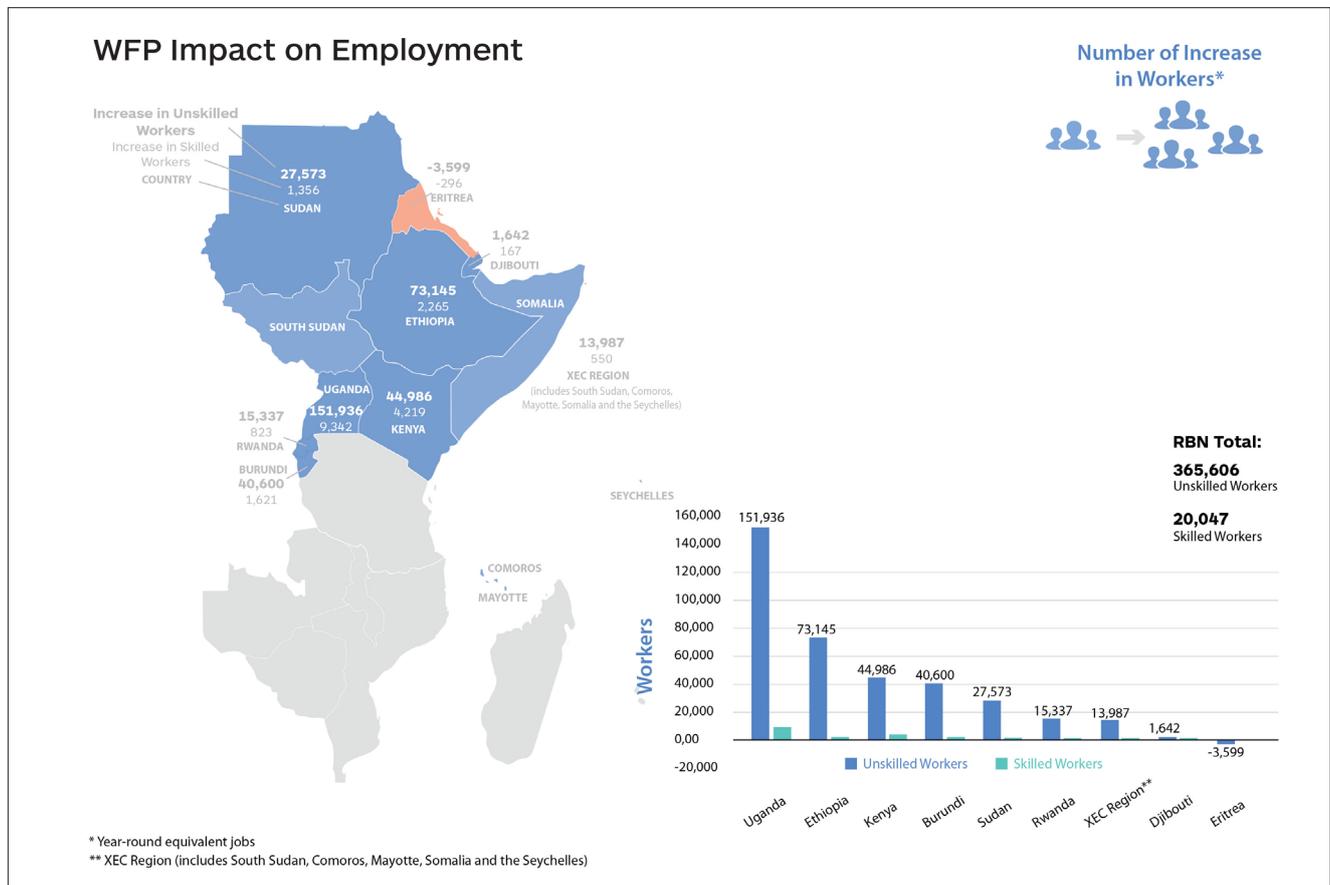


Figure 5. WFP operations have large employment impacts in East Africa

Figure 6 illustrates production impacts under the two labour supply scenarios. The orange bars correspond to the less restrictive case, where labor

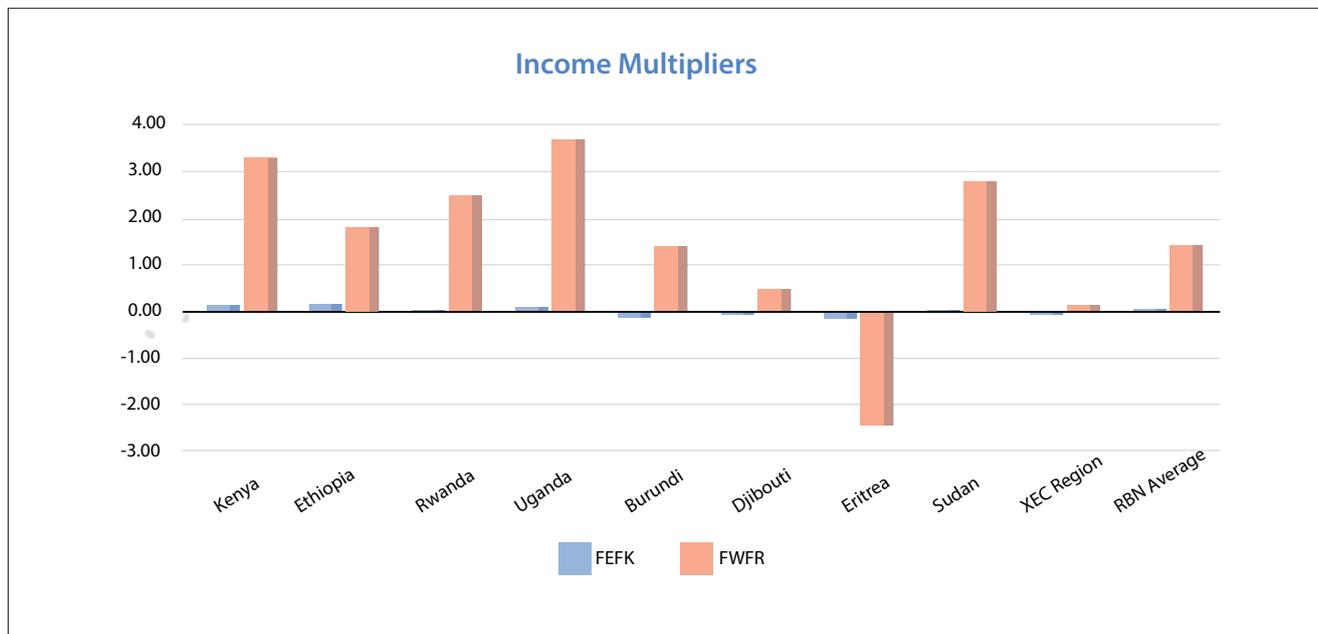
and capital are available, and the blue bars depict the pessimistic case where labor and capital are fixed.



Figure 6. Impacts of WFP spending on total production value are large and positive where labor and capital are available but small and often negative where they are not.

If both labor and capital are available, WFP spending creates positive and in many cases large production, real income, and employment multipliers. In contrast, when both labor and capital are fixed, the positive impacts of WFP spending become small or negative. In Kenya, for example, a \$1 increase in WFP expenditures results in an increase in total production value of \$6.47 under the optimistic scenario. In the fixed-labor and capital case, the

total production impact is small and negative, 0.14. The impacts on real GDP (Figure 7) and on employment also vary between the optimistic and pessimistic cases. They are almost always large and positive in the optimistic case, and they are small and sometimes negative in the pessimistic case. In fact, the total labor force is fixed under the pessimistic assumptions, so there can be no effect of WFP spending on employment.



**Figure 7.** Impacts on real income are almost always large and positive in the optimistic case but small and sometimes negative in the pessimistic case.

Taken together, these findings suggest that, if labour and capital are available, WFP spending can have a large impact on production and GDP in East Africa. WFP expenditures are small compared with the size of East African economies. Nevertheless, each dollar spent by the RBN, according to our simulations, increases real income (GDP) by considerably more than one dollar in most cases.

Impacts of WFP spending depend critically on the structure of the economy, however. For example, our simulations show small negative impacts (and higher price and wage inflation) if additional labour and capital are not available. In an economy without excess capacity and unemployed workers, WFP spending on goods and services from some

production sectors can crowd out production in other sectors and cause inflation, rather than contributing to real income and production growth in the economy. Highly import-dependent countries get fewer benefits from WFP spending, as trade shifts impacts to exporting countries.

Given persistently high unemployment rates, it is likely that the current state of economies in East Africa is characterized by at least some excess capacity. If so, WFP spending is likely to create real economic benefits in addition to its primary objective of distributing food and cash assistance. While this finding is cautiously optimistic, it is important to keep in mind the sensitivity of findings to the structure of the economies in question.