



INTERNATIONAL
FOOD POLICY
RESEARCH
INSTITUTE

IFPRI



IFAD

Investing in rural people

Identifying Investment Priorities for Malawian Agriculture

Rui Benfica (IFAD) and James Thurlow (IFPRI)

Presentation to the Ministry of Agriculture, Irrigation and Water Development

Lilongwe, 8 February 2017

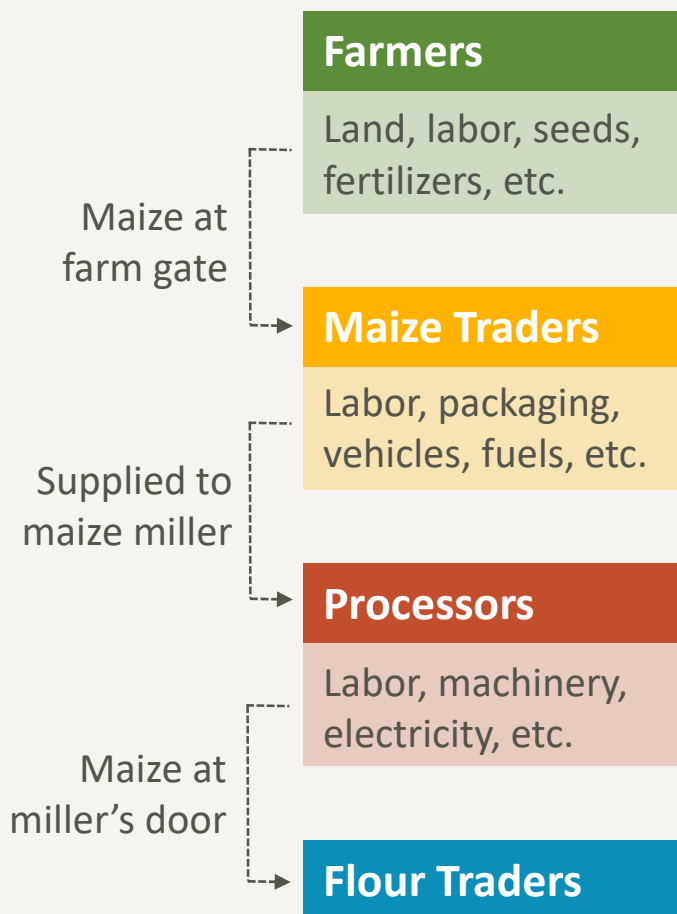
With support from CGIAR Research Program on “Policies, Institutions and Markets” (PIM)
and Gates Foundation Project “Advancing Research on Nutrition and Agriculture”

Strategic Concerns

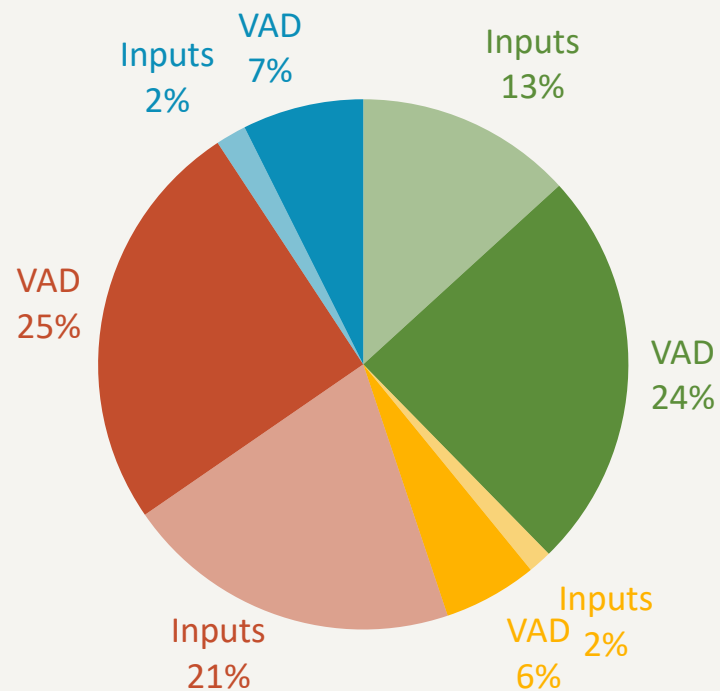


- **Agriculture will remain the core engine of Malawi's economy**
 - Main source of economic growth and foreign exchange
 - Most Malawians rely on farm incomes
 - Crucial for reducing poverty in rural (and urban) areas
- **Two-pronged investment strategy is probably required**
 - Promote food security by continuing to invest in traditional staple crops
 - Diversify into higher-value and nutritious farming (ideally building on existing investments and progress)
- **But which value-chains, if scaled-up, are most effective at...**
 - Accelerating (and sustaining) agricultural and national economic growth
 - Raising farmers' incomes and reducing poverty
 - Creating jobs on and off the farm
 - Improving nutrition by diversifying diets

Maize-Flour Value-Chain

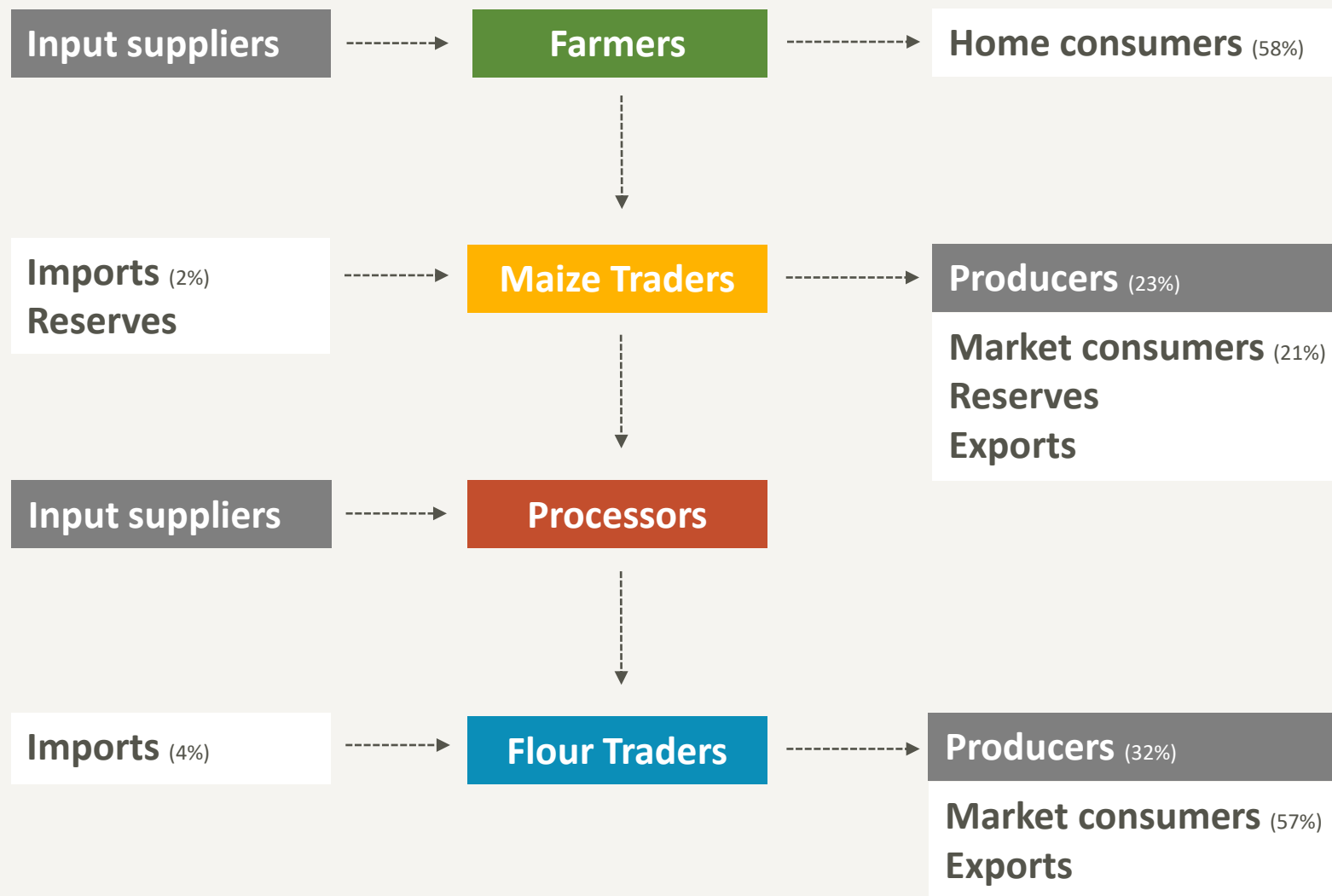


Milled maize market price =
Inputs + Value-Added (VAD)

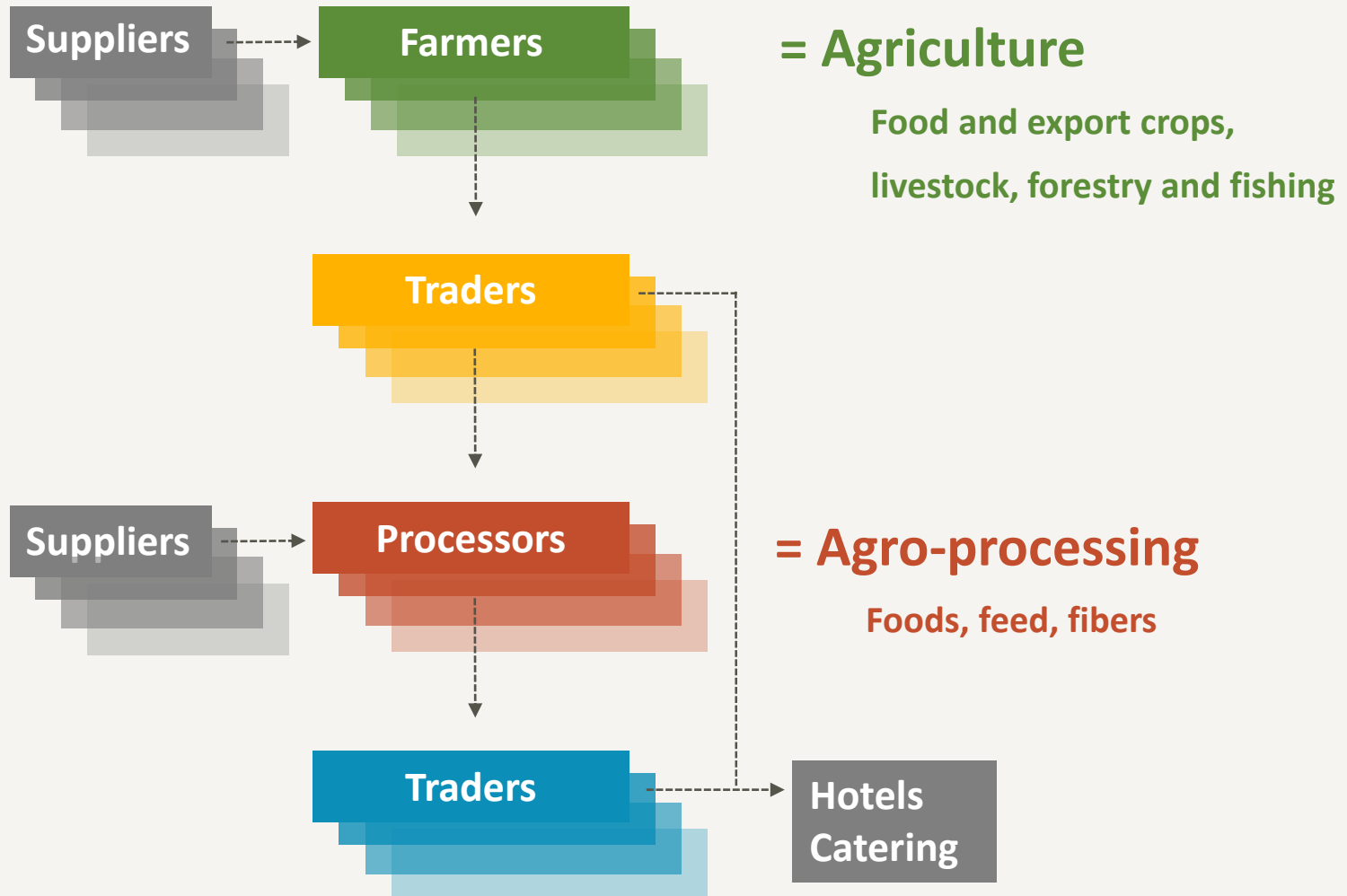


Total VAD = 63%
Total trade margin = 16%

Maize-Flour System



Agriculture-Food System (AFS)



Measuring the AFS



Share of national total, 2014 (%)

	GDP	Employment	
National economy	100	100	
Agriculture-food system	44.5	73.9	
Direct production	35.9	68.3	National accounts' sectoral GDP estimates (as reflected in SAM)
Agriculture	29.2	65.3	
Agro-processing	6.8	3.0	
Input production	2.6	0.9	Portion of GDP in domestic input producing sectors (AFS share of total input demand)
Agriculture	0.9	0.4	
Agro-processing	1.6	0.6	
Trade and transport	6.0	4.7	Portion of trade and transport GDP (AFS transaction cost margin share of total T&T demand)
Agriculture	3.0	2.3	
Agro-processing	3.0	2.3	
Hotels and catering	1.0	1.5	Portion of hotels and catering GDP (share of AFS inputs in total input demand in H&C sector)

Source: Malawi SAM and IHS3

Economywide Value Chain Analysis

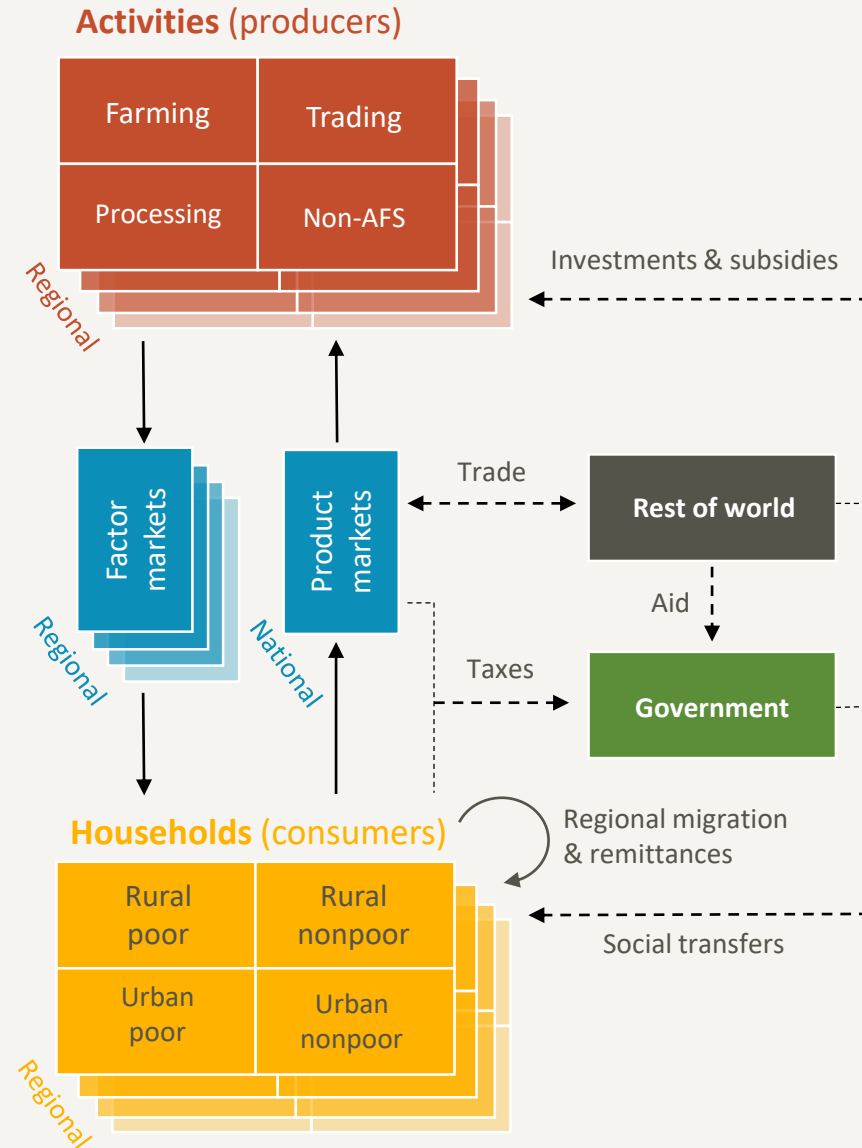


- **Value-chain analysis provides the “business case” for investment**
 - But these studies are often static and focus on certain products
- **When at scale, value-chains have economy-wide implications:**
 - Positive spillovers to other VCs and parts of the economy
 - Resource competition may mean that a new VC comes at the expense of an existing one (e.g., land displacement; labor and foreign exchange shortages; limited consumer purchasing power)
- **Need to establish the “development case” for a VC strategy by considering economy-wide benefits and costs**

RIAPA Model



- **Rural Investment and Policy Analysis (RIAPA) Model**
- **Detailed economic structure**
 - 70 productive sectors
 - 13 factors (land, labor, capital)
 - 15 representative households
- **Resource constraints**
 - Crop land and educated labor is fully-employed (wages adjust)
 - Less-educated workers are underemployed (wages fixed)
- **Recursive dynamic**
 - Saving → Investment → Capital stock



Business-as-Usual Scenario, 2016-2020



Annual change (%)

	BAU	History
Population	3.0	3.0
Urban	3.7	3.7
Total GDP	5.1	5.2
Agriculture	3.6	3.5
Industry	6.1	7.7
Agro-processing	6.0	n/a
Services	5.5	5.7
Employment	2.9	3.3
Crop land	2.7	2.7
Consumption per capita	2.0	2.1
Poverty headcount rate	-2.5	-3.3
Poverty-growth elasticity	-1.2	-1.5
Semi-PGE	-0.6	-0.7

Observed trends for 2004-2014

Agriculture grows faster than population, but share of GDP declines

Increasing share of agricultural output is processed

Pattern of growth determines consumption, distribution, and poverty outcomes

% change in poverty rate per 1% increase in GDP per capita (semi-PGE is point change)

Source: Malawi RIAPA Model

Value-Chain Expansion Scenarios



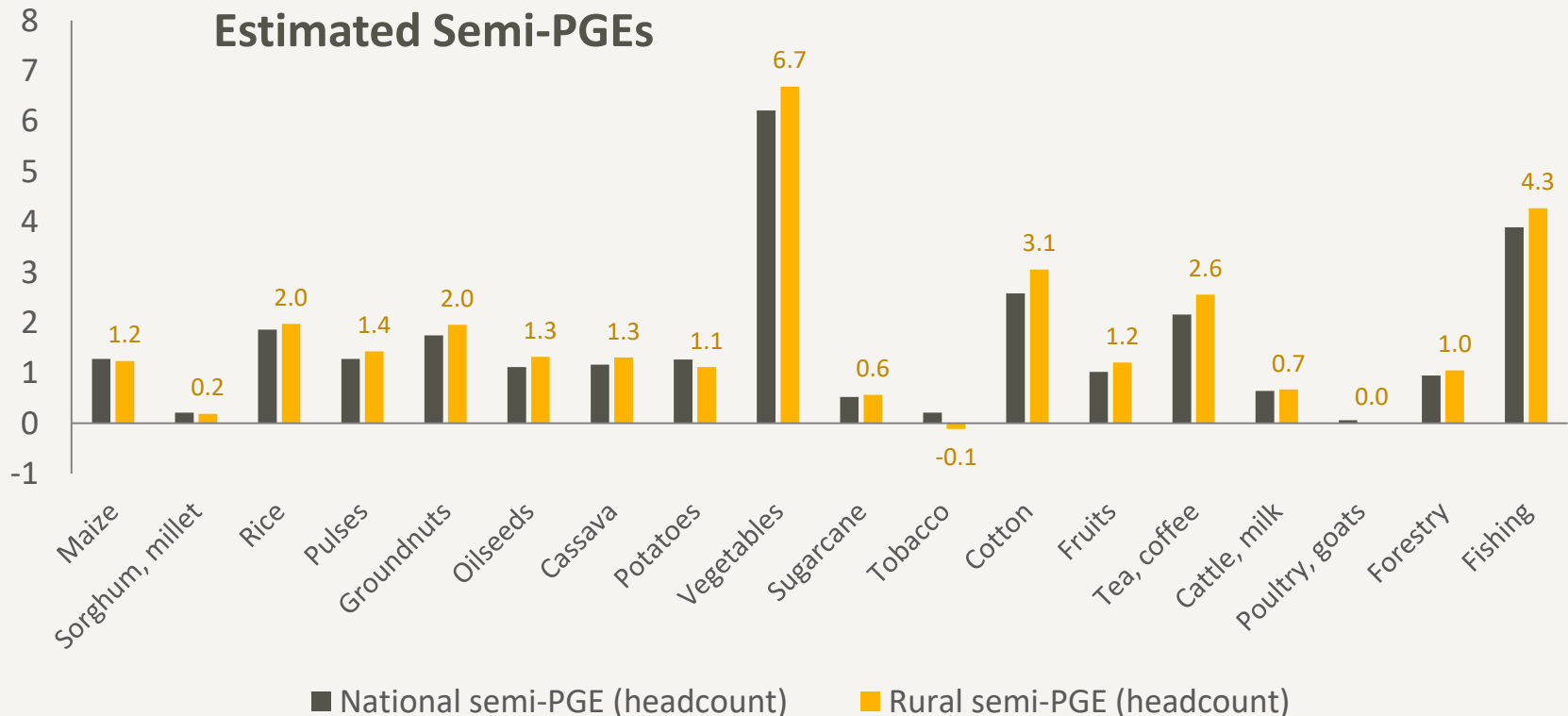
- **Increase productivity growth in specific agricultural sectors**
 - Target the same absolute increase in agricultural GDP (i.e., 1% by 2020)
 - Small sectors need to grow fast, but this makes scenarios comparable
- **Captures spillovers and trade-offs**
 - Stimulates growth along and beyond the targeted value chain
 - Growth starts but is not limited to targeted value-chain (e.g., farmers may diversify cropping patterns)
 - BUT expanding value chain demands inputs, land and labor, some of which comes from other value-chains

Category	Detailed products
Maize	Maize
Sorghum, millet	Sorghum; millet
Rice	Paddy rice
Pulses	Beans; peas; lentils; other pulses
Groundnuts	Groundnuts
Oilseeds	Soybeans; sunflower; other oilseeds
Cassava	Cassava
Potatoes	Potatoes
Vegetables	Tomatoes; cabbages; onions; etc.
Sugarcane	Sugarcane
Tobacco	Tobacco
Cotton	Cotton
Fruits	Fruits; macadamia; other tree crops
Tea, coffee	Tea; coffee; other crops
Cattle, milk	Cattle; milk
Poultry, goats	Poultry; eggs; goats; other livestock
Forestry	Raw timber; forestry products
Fishing	Fishing and aquaculture

Poverty Effects



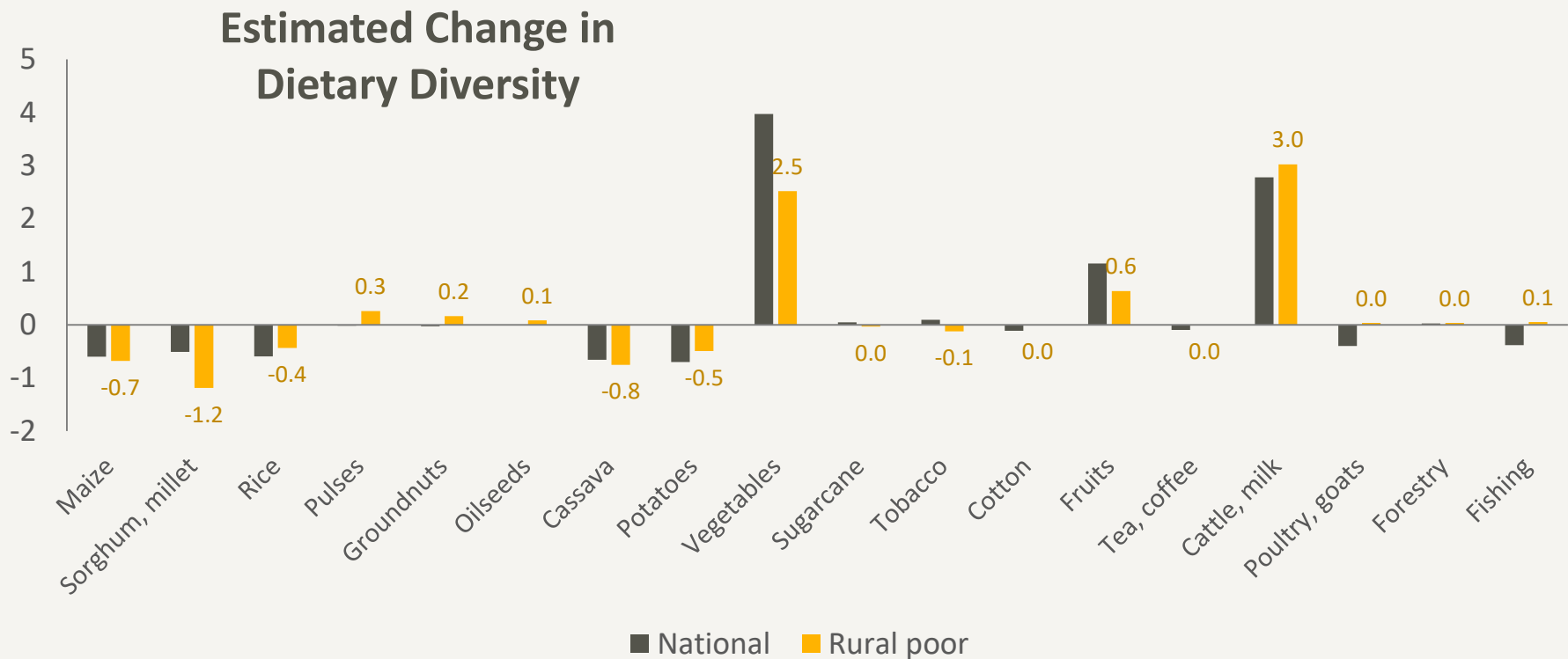
- Most effective VCs at generating poverty-reducing growth in rural areas are **vegetables**, **fishing** and **cotton**
 - Poverty-Growth Elasticity (PGE) = % change in poverty rate given a 1% increase in agricultural GDP per capita



Nutrition Effects



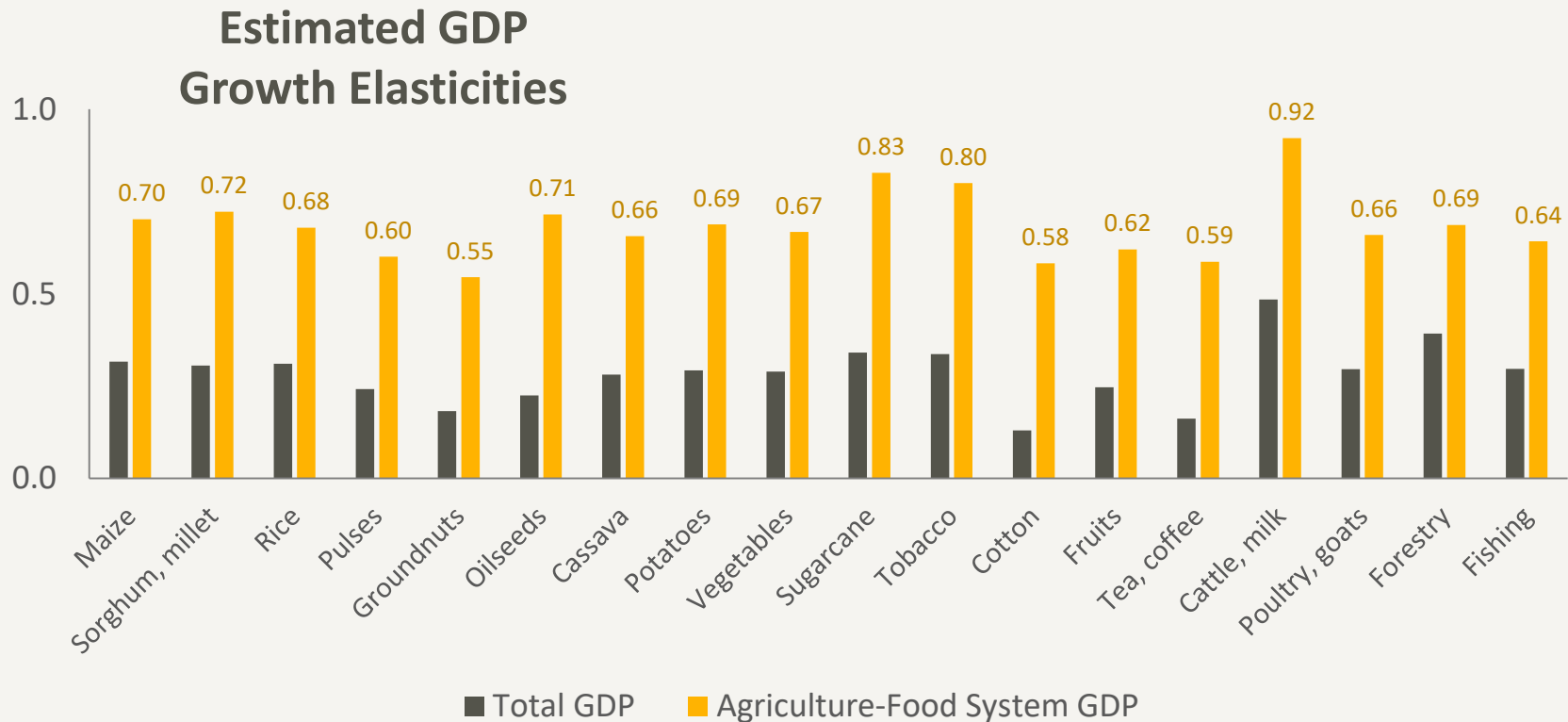
- Most effective VCs at promoting dietary diversity of the rural poor are **cattle/milk, vegetables, and fruits**
 - Dietary diversification is correlated with improved nutrition
 - Direct effect = food production; Indirect effect = raising incomes



Growth Effects



- Most effective VCs at generating AFS growth are **cattle/milk**, **sugarcane** and **tobacco**
 - Growth elasticity = % change in total or AFS GDP given a 1% increase in agricultural GDP driven in the targeted VC



Top-Ranked Value-Chains

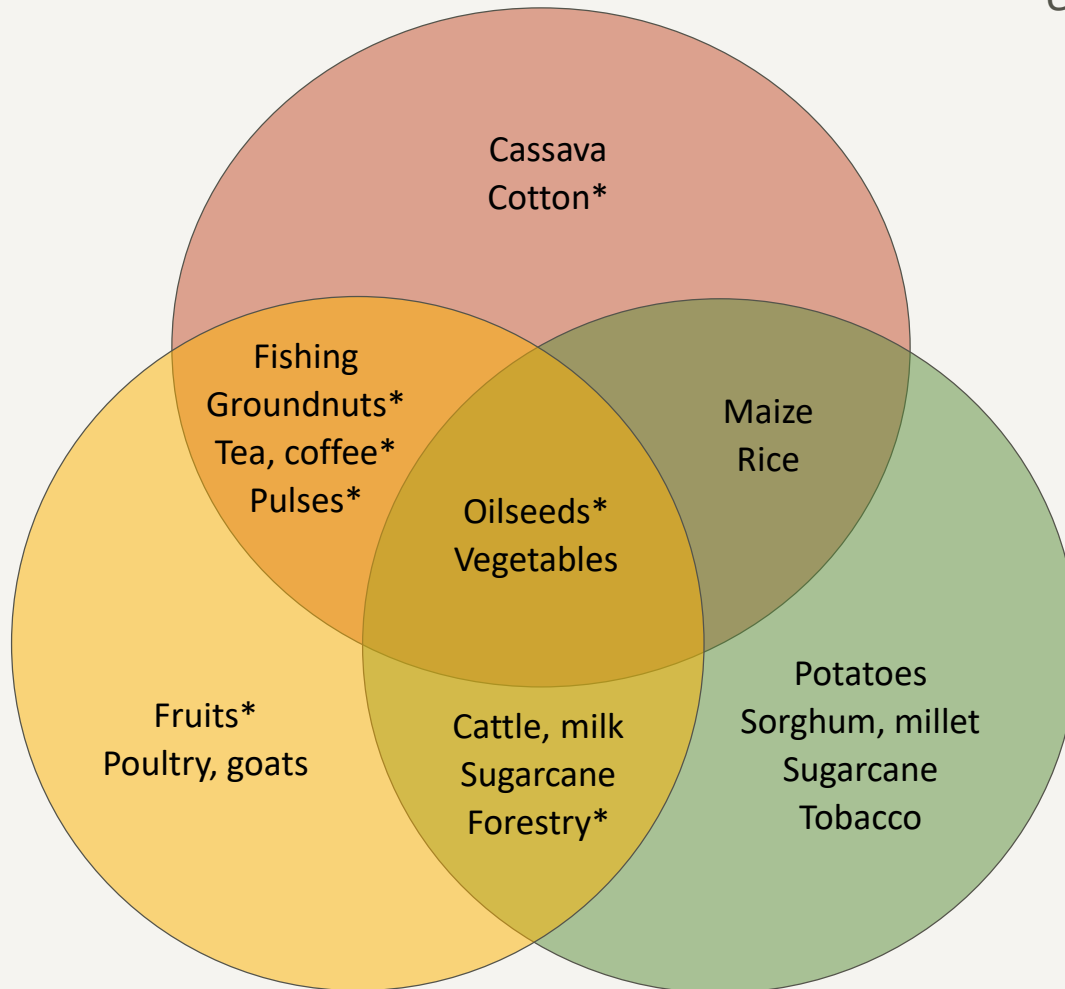


Rural poverty
(poverty effect)

* indicates positive
employment effect

**Dietary diversity
of the poor**
(nutrition effect)

AFS GDP
(growth effect)



Ranked Portfolio of Value-Chains



- **No single value-chain is the best at achieving all targets**
 - Need a balanced portfolio of value-chains
- **Composite indicator of poverty, nutrition and growth effects**
 - Equal weights (33%, 33%, 33%) or bias weighted (50%, 25%, 25%)

	Equal weighting	Poverty-bias	Nutrition-bias	Growth-bias
1	Vegetables	Vegetables	Cattle, milk	Cattle, milk
2	Cattle, milk	Cattle, milk	Vegetables	Vegetables
3	Fruits	Fishing	Fruits	Fruits
4	Fishing	Fruits	Pulses	Fishing
5	Pulses	Cotton	Fishing	Pulses
6	Groundnuts	Pulses	Groundnuts	Groundnuts
7	Cotton	Groundnuts	Oilseeds	Cotton
8	Tea, coffee	Tea, coffee	Cotton	Oilseeds
9	Oilseeds	Oilseeds	Tea, coffee	Tea, coffee
10	Forestry	Forestry	Forestry	Forestry

Conclusion

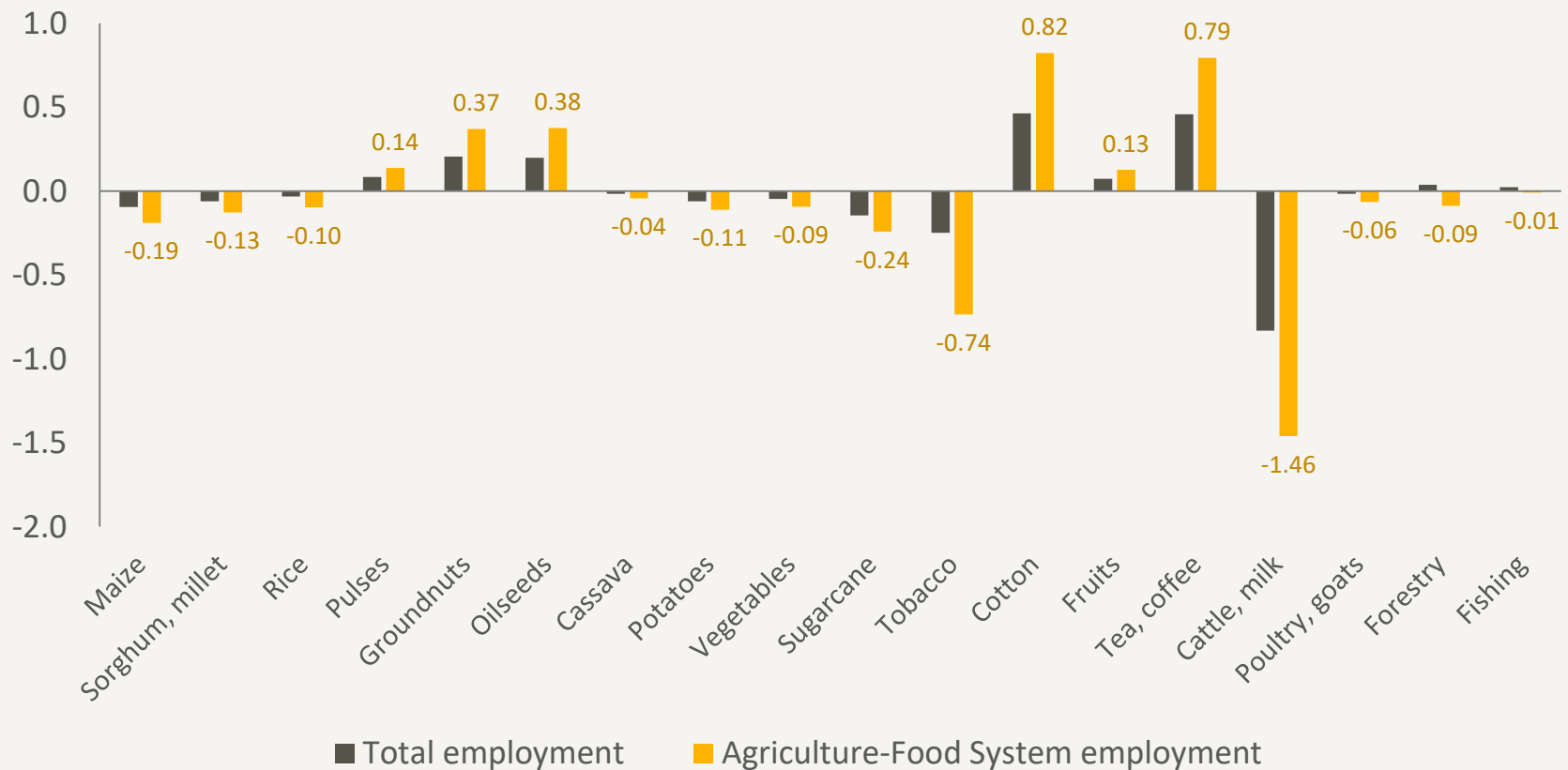


- **No single value-chain is the best at achieving all targets**
 - i.e., reducing poverty, diversifying diets, promoting growth, creating jobs
- **Growth in Malawi's dominant maize sector is still pro-poor**
 - But there are VCs whose expansion would further enhance agriculture's contribution to achieving national objectives
- **A balanced and prioritized portfolio of VCs should also include...**
 - Vegetables, cattle/milk, and fruits/tree crops
 - Pulses contribute to diversifying diets, but are less effective at generating economywide growth
 - Oilseeds are also a viable option for achieving multiple objectives, but is not the most effective value chain in any particular area

Annex: Employment Effects



- Most effective VCs at creating jobs in the AFS (per unit of agricultural GDP growth) are **cotton, tea/coffee** and **oilseeds**



Annex: National Economy



	GDP (%)	Employment (%)	Exports (%)	Imports (%)	Exports/Output (%)	Imports/Demand (%)
All sectors	100	100	100	100	7.9	24.0
Agriculture	29.2	65.3	21.6	2.7	11.8	3.7
Crops	17.0	28.8	21.6	2.4	22.4	6.2
Livestock	2.7	13.7	0.0	0.2	0.0	2.3
Forestry	8.5	20.6	0.0	0.0	0.0	0.0
Fishing	0.9	2.2	0.0	0.0	0.0	0.0
Industry	16.5	6.4	69.9	84.1	18.0	52.1
Mining	1.5	0.4	3.2	0.1	30.3	4.1
Manufacturing	9.4	4.2	66.8	84.0	28.0	64.7
Agro-processing	6.9	3.0	58.7	7.8	31.9	19.5
Other manufactures	2.8	1.6	8.7	77.1	13.0	84.8
Other industry	5.6	1.8	0.0	0.0	0.0	0.0
Services	54.4	28.3	8.5	13.2	1.9	6.1
Trade, hotels, catering	19.0	17.2	3.7	3.1	2.5	4.3
Transport services	7.1	2.2	2.2	3.5	3.9	12.4
Finance & business	15.0	1.1	2.0	4.8	1.9	8.7
Government	8.5	5.7	0.6	1.2	0.6	2.5
Other services	4.9	2.0	0.0	0.6	0.0	3.8

Annex: Agricultural Production



	Agriculture GDP share (%)	GDP per worker (\$)	Cultivated hectares (1000)	Hectares per worker	Crop yield (tons per hectare)
Agriculture	100	339	5,221	0.9	-
Maize	16.4	619	2,557	0.2	2.3
Sorghum, millet	1.3	196	142	0.7	1.0
Rice	1.7	553	69	0.7	1.9
Pulses	7.0	660	778	0.2	0.9
Groundnuts	5.4	644	376	0.3	1.1
Oilseeds	1.3	466	158	0.3	1.7
Cassava	3.8	618	43	2.2	23.6
Potatoes	3.9	637	57	1.6	18.5
Vegetables	2.7	251	79	2.1	5.1
Sugarcane	1.0	723	26	0.8	109.5
Tobacco	3.9	404	332	0.4	1.2
Cotton	1.1	301	299	0.2	0.9
Fruits	6.6	252	108	3.7	11.1
Tea, coffee	2.2	271	198	0.6	2.5
Cattle, milk	1.7	115	-	-	-
Poultry, goats	7.7	163	-	-	-
Forestry	29.3	314	-	-	-
Fishing	3.0	301	-	-	-

Annex: Household Expenditures



	National	Rural	Rural Poor	Urban
Population (millions)	16.7	14.1	6.4	2.6
Consumption per capita (\$)	319	206	88	945
Food consumption share (%)	100	100	100	100
Cereals and roots	39.2	44.3	59.9	27.6
Vegetables	2.8	2.9	3.3	2.7
Fruits	6.3	7.1	7.5	4.4
Meat, fish and eggs	23.2	20.4	12.6	29.7
Milk and dairy	2.7	1.5	0.3	5.4
Pulses and oilseeds	15.5	14.7	10.7	17.2
Sugars	5.2	5.1	3.4	5.3
Other foods	5.1	4.0	2.2	7.8
Food consumption share (%)	33.4	42.7	47.3	22.3
Processed food share (%)	51.1	43.9	35.3	67.6

Annex: Household Incomes



	National	Rural	Rural Poor	Urban
Total household income (%)	100	100	100	100
Crop land returns	9.4	16.8	23.7	0.9
Labor remuneration	37.0	33.9	39.1	40.6
Less-educated workers	21.4	30.4	38.5	10.9
Better-educated workers	15.6	3.5	0.6	29.7
Capital profits	51.4	46.9	35.0	56.6
Other sources	2.2	2.4	2.1	1.9