



Agriculture Productivity Growth and Rural Welfare: Insights from Economy-wide Analysis

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The Importance of Agriculture

- **Primary agriculture (including both crops and livestock but not food processing and distribution) comprises 20 percent of the national economy**
 - **Domestic agricultural production is:**
 - **Critical to Pakistan's food security and relieving malnutrition**
 - **A major source of income for Pakistan's rural poor**
 - **Provides the raw cotton to the yarn and textile industries that generate most of Pakistan's foreign exchange earnings**
 - **Poverty is heavily concentrated in rural areas, both among small-scale-farm and rural non-farm households**
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Pakistan National Economic Structure 2007-08

	Share of total (%)				Exports/ output (%)	Imports/ supply (%)
	GDP	Employ- ment	Exports	Imports		
All sectors	100	100	100	100	5.4	12.8
Agriculture	20.3	49.9	1.7	2.8	0.7	2.4
Crops	8.9	37.2	1.0	2.8	0.9	5.8
Livestock	10.6	10.9	0.0	0.0	0.0	0.0
Other	0.8	1.7	0.7	0.0	7.1	0.0
Industry	26.8	17.9	74.2	77.2	8.0	19.0
Mining	3.0	0.6	0.0	10.8	0.0	33.9
Manufacturing	19.7	11.1	74.2	66.3	10.0	20.3
Agro-processing	8.7	2.9	10.6	6.6	4.2	7.4
Textiles, clothing	2.3	2.3	45.9	1.7	21.7	2.3
Other	8.7	5.8	17.7	58.0	4.5	32.3
Electricity, water	1.5	0.2	0.0	0.0	0.0	0.0
Construction	2.6	6.0	0.0	0.0	0.0	0.0
Services	52.9	32.2	24.0	20.0	3.7	7.3
Trade and hotels	30.1	24.4	18.3	0.0	4.8	0.0
Finance, business services	14.7	4.0	0.0	14.8	0.0	22.2
Public, social services	6.8	1.1	0.0	0.0	0.0	0.0
Other services	1.4	2.7	5.7	5.2	20.5	32.0

Source: 2007/08 Pakistan Social Accounting Matrix (Debowicz et al. 2012).

Pakistan: Sources of Economic Growth

	Shares or value		Average annual growth (%)			Contribution to growth (%)		
	1999/00	2013/14	1999/00- 2013/14	1999/00- 2005/06	2005/06- 2013/14	1999/00- 2013/14	1999/00- 2005/06	2005/06- 2013/14
All sectors (%)	100	100	3.7	3.9	3.6	100	100	100
Agriculture	27.9	21.0	1.6	0.6	2.4	10.7	3.8	15.0
Crops	13.5	8.4	0.3	-1.3	1.5	0.8	-4.0	3.8
Livestock	13.1	11.8	2.9	2.5	3.3	9.8	8.0	10.9
Other	1.3	0.9	0.5	-0.7	1.4	0.2	-0.2	0.4
Industry	17.3	20.8	5.1	7.3	3.5	26.1	35.2	20.4
Mining	2.4	3.0	5.3	9.3	2.4	3.9	6.7	2.1
Manufacturing	9.9	13.5	6.0	9.8	3.3	18.9	28.9	12.6
Electricity, water	2.6	1.9	1.5	-6.0	7.4	0.9	-3.1	3.4
Construction	2.3	2.4	3.9	4.4	3.5	2.5	2.7	2.3
Services	54.8	58.1	4.2	4.3	4.1	63.2	60.9	64.6
Trade and hotels	30.3	31.6	4.0	4.9	3.3	33.4	39.3	29.7
Finance, business, real estate	10.5	9.9	3.3	3.5	3.2	9.0	9.2	8.9
Public, social services	6.0	7.0	4.9	2.5	6.8	8.6	3.7	11.7
Other services	8.0	9.7	5.1	4.2	5.8	12.1	8.7	14.3

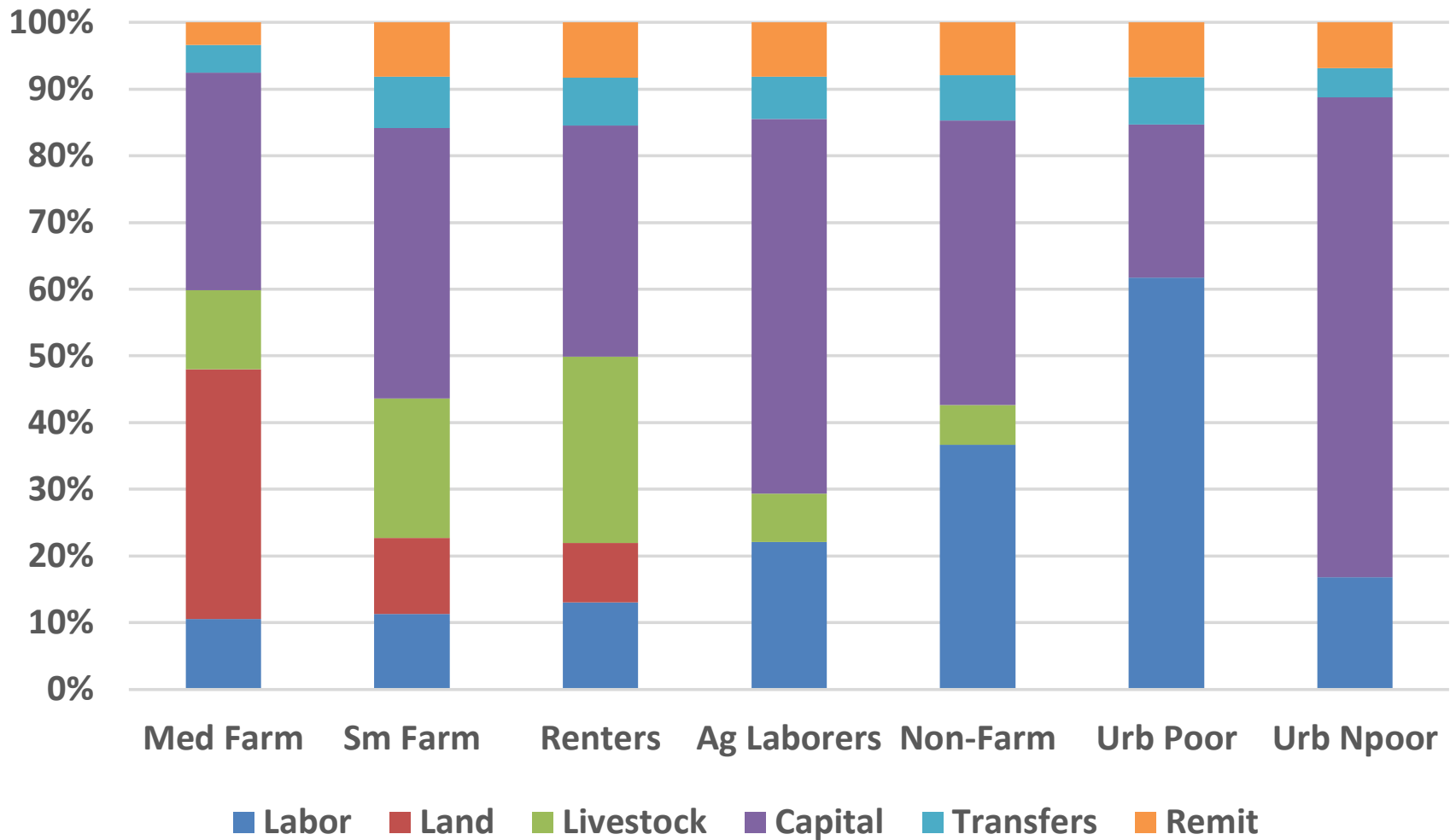
Source: Dorosh and Thurlow (2015) using Pakistan Bureau of Statistics data.

Pakistan Household Income Sources and Poverty Rates

	National	Rural					Non-farm	Urban
		All rural	Farming			Farm workers		
			Larger-scale	Small-scale	Landless renters			
Population (mil.)	130.5	87.7	3.7	24.7	7.8	6.7	44.7	42.9
Poverty headcount rate (%)	35.4	39.0	24.7	34.5	51.2	63.4	36.8	28.2
Per capita consumption (R1000)	61.6	58.2	227.3	60.9	48.9	42.9	46.4	68.8
US\$ (market exchange rate)	986	930	3,634	973	782	686	743	1,100
Income share (%)	100	100	100	100	100	100	100	100
Labor compensation	22.7	22.6	10.6	11.4	13.2	22.2	36.5	22.9
Land returns	12.6	22.8	49.5	32.5	37.0	7.3	6.0	0.0
Capital returns	51.7	40.6	32.5	40.3	34.3	56.0	42.9	65.3
Government transfers	5.8	6.7	4.2	7.7	7.2	6.3	6.8	4.8
Foreign remittances	7.2	7.3	3.1	8.1	8.3	8.1	7.9	7.1

Source: 2007/08 Pakistan Social Accounting Matrix (Debowicz et al. 2012).

Sources of Income of Pakistan Rural Households by Household Group



Source: 2007/08 Pakistan Social Accounting Matrix (Debowicz et al. 2012).

Pakistan CGE Model: Base Simulation

- **Base: Approximates the relatively high annual growth rates of 2010/11 to 2012/13**
 - **Agriculture (3.2%), industry (3.0%), services (4.1%)**
- **New investments in energy: electricity increases by 7.7% per year**

Results

- **GDP Growth 3.64%**
 - **Poverty falls from 36.1% to 21.7%**
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Alternative Scenarios

- **Slower productivity growth in:**
 - **1: Crops (slower yield growth of 2007/08-10/11)**
 - **2: Livestock (lower livestock number growth of 2007/08-10/11)**
 - **3: Electricity (only 1/3 of planned new investment takes place)**
 - **4: Manufacturing (productivity growth of non-agriculture related sectors falls to 2007/08-10/11 rate)**
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Simulated Impacts of Economic Shocks

	Baseline changes or values	Deviation in scenario outcomes from baseline			
		Crops	Live-stock	Elec-tricity	Manu-facturing
Annual GDP growth (%)	3.64	-0.13	-0.27	-0.20	-0.15
Agriculture	3.21	-0.35	-1.38	-0.02	-0.01
Industry	3.00	-0.19	0.06	-0.54	-0.71
Services	4.07	-0.03	-0.05	-0.11	0.05
Private consumption	3.56	-0.16	-0.38	-0.28	-0.19
Rural	3.42	-0.19	-0.34	-0.42	-0.14
Urban	3.81	-0.11	-0.44	-0.01	-0.26
Investment	3.99	-0.05	0.10	-1.26	-0.84
Public consumption	3.80	0.00	0.00	0.00	0.00
Exports	4.51	0.00	0.02	0.22	-1.94
Imports	4.20	-0.09	-0.02	-0.57	-1.17
Real exchange rate index	0.00	0.03	-1.90	-0.13	3.29
Food price index	0.00	1.50	1.82	-0.86	0.11

Source: Dorosh and Thurlow (2015).

Simulated Impacts of Economic Shocks (2)

	Baseline changes or values	Deviation in scenario outcomes from baseline			
		Crops	Live- stock	Elec- tricity	Manu- facturing
Labor wage growth (%)	1.52	-0.23	-0.61	-0.73	-0.46
Agricultural workers	1.41	-0.29	-0.11	-0.38	-0.39
Unskilled workers	1.09	-0.23	-0.72	-0.75	-0.19
Skilled workers	2.00	-0.22	-0.68	-0.83	-0.76
Land returns	3.09	-0.24	-0.70	-0.43	-0.59
Capital returns	1.50	-0.19	-0.65	0.12	-0.19
Poverty headcount (%)	21.73	0.82	1.47	3.07	0.41
Rural households	24.38	1.00	1.59	3.19	0.44
Urban households	16.31	0.46	1.23	2.81	0.35

Source: Dorosh and Thurlow (2015).

Implications of Lower Electricity Supply

- **Industrial GDP growth falls by 0.5 percentage points per year relative to the baseline.**
 - **Lower industrial GDP growth reduces demand for agricultural products, leading to lower agricultural wages and farm incomes.**
 - **Slower growth of energy supply causes energy prices to rise and nonfarm wages to fall, reducing real incomes and increasing poverty for both rural and urban households.**
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Summary of the Model Analysis

- **Taking market outcomes, resource reallocations and non-agricultural growth linkages into account, agricultural growth significantly raises rural and urban household incomes and has corresponding poverty-reducing effects**
 - **Slowing down the increase in electricity supply has the largest impact on poverty, even though it does not have the largest impact on economic growth or aggregate private consumption**
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Conclusions

- **Model simulations show that if the agriculture and energy sectors revert to their slow growth rates experienced in the late 2000s, then poverty could increase over the coming years.**
 - **Thus, agriculture and energy are far from inconsequential to Pakistan: rather, they are major pillars of a national development strategy.**
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