

# Agriculture in Pakistan

## Metrics Used

We use the following indicators to generate our metrics

**Value Added in Agriculture, constant 2010 US\$:** The net output of the Agriculture sector, including forestry hunting and fishing, after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciations of fabricated assets or depletion and degradation of natural resources.

**Employment in Agriculture (% of total employment) (modeled ILO estimate):** Employment is defined as persons of working age who were engaged in any activity to produce goods or produce services for pay or profit, whether at work during the reference period or not at work due to temporary absence from a job, or to working-time arrangement. The agriculture sector consists of activities in agriculture, hunting, forestry and fishing

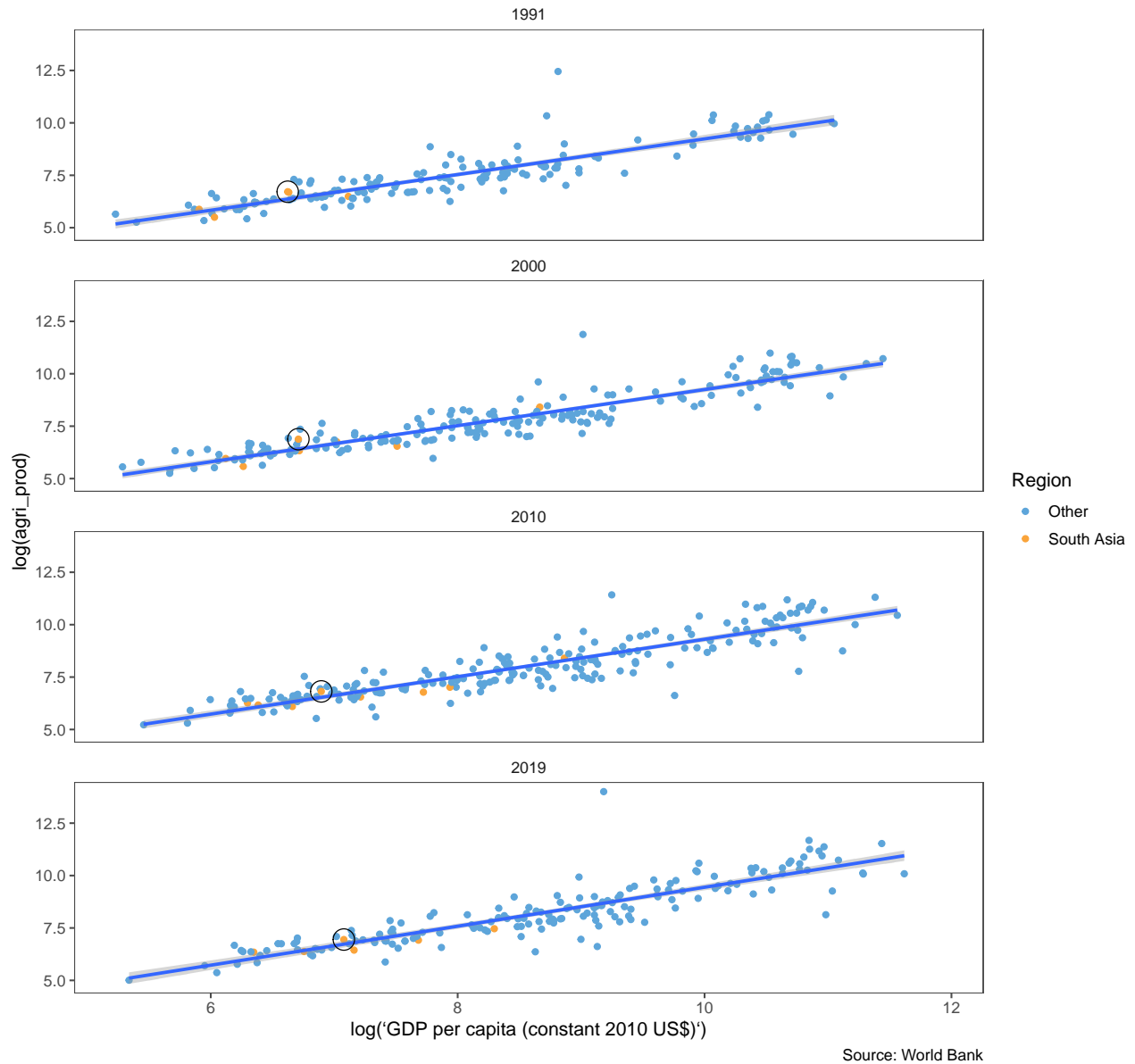
**Working Age Population:** Total population between the ages 15 to 64.

**Arable Land:** Arable land (in hectares) includes land defined by the FAO as land under temporary crops (double-cropped areas are counted once), temporary meadows for mowing or for pasture, land under market or kitchen gardens, and land temporarily fallow. Land abandoned as a result of shifting cultivation is excluded.

## Pakistan have low Value Added per Worker in Agriculture?

For it's level of GDP per Capita, Pakistan has a slightly above-expected valued added per worker in agriculture.

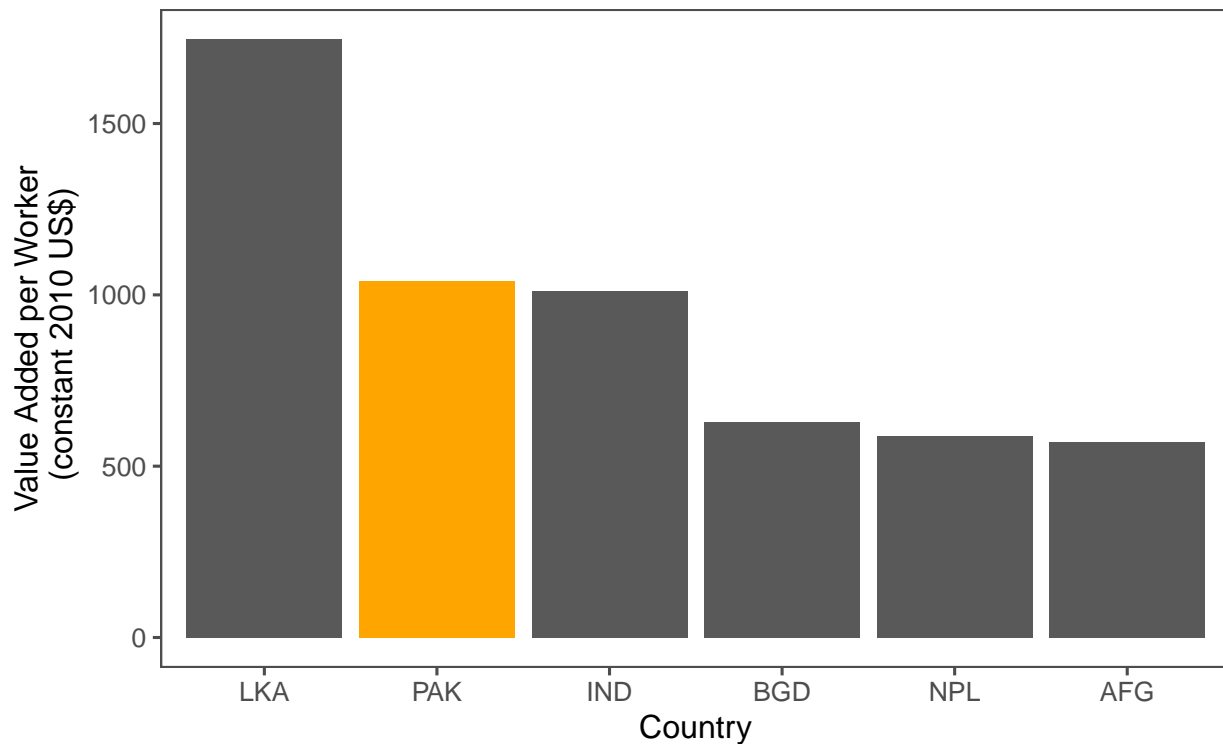
### Comparing Value Added per Worker in Agriculture Pakistan circled



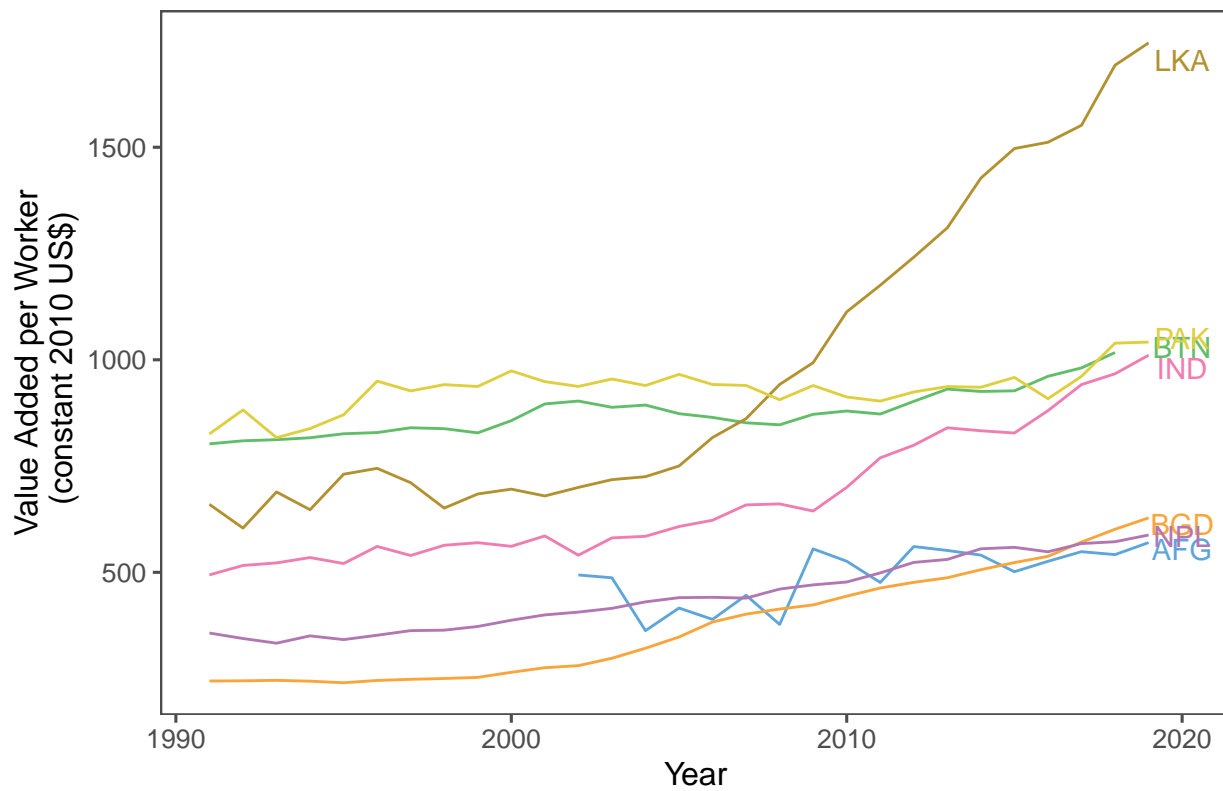
### How does Pakistans Value Added per Worker Change over Time?

While it has a relatively high level of value added per worker in agriculture, Pakistan has the slowest growth in value added per worker between 2000 and 2019 in South Asia.

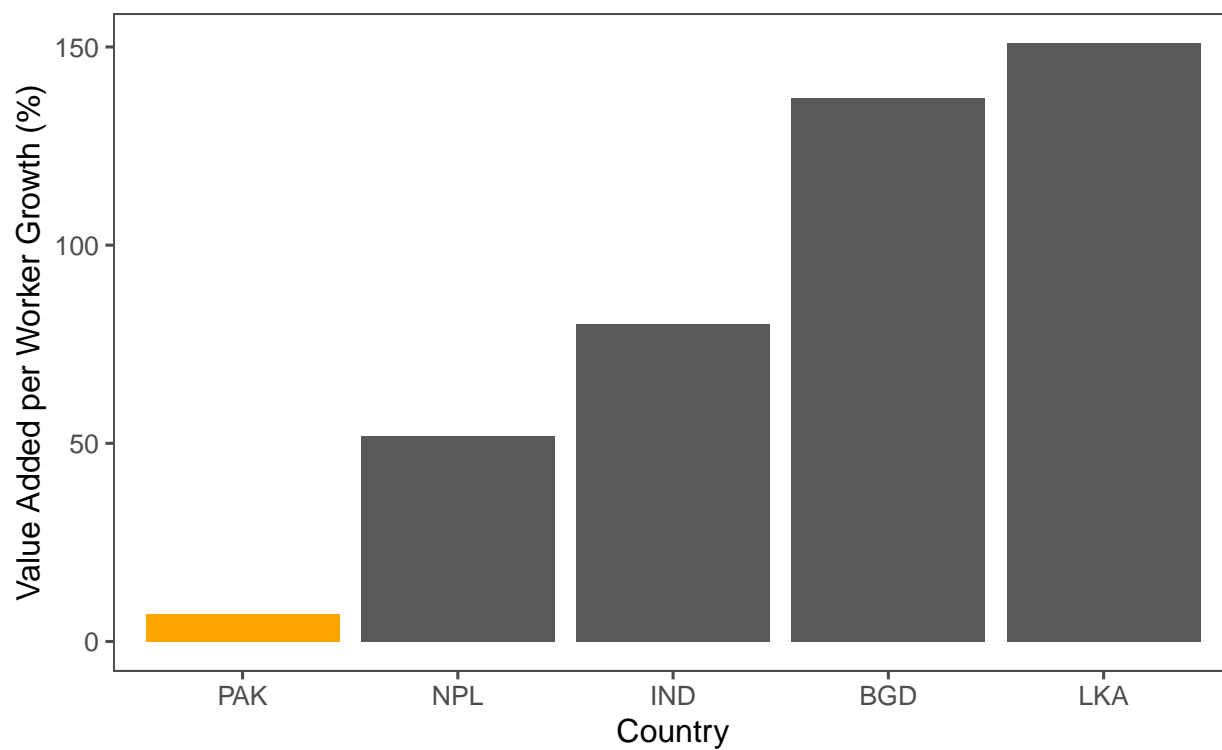
South Asian Value Added in Agriculture per Worker  
2019

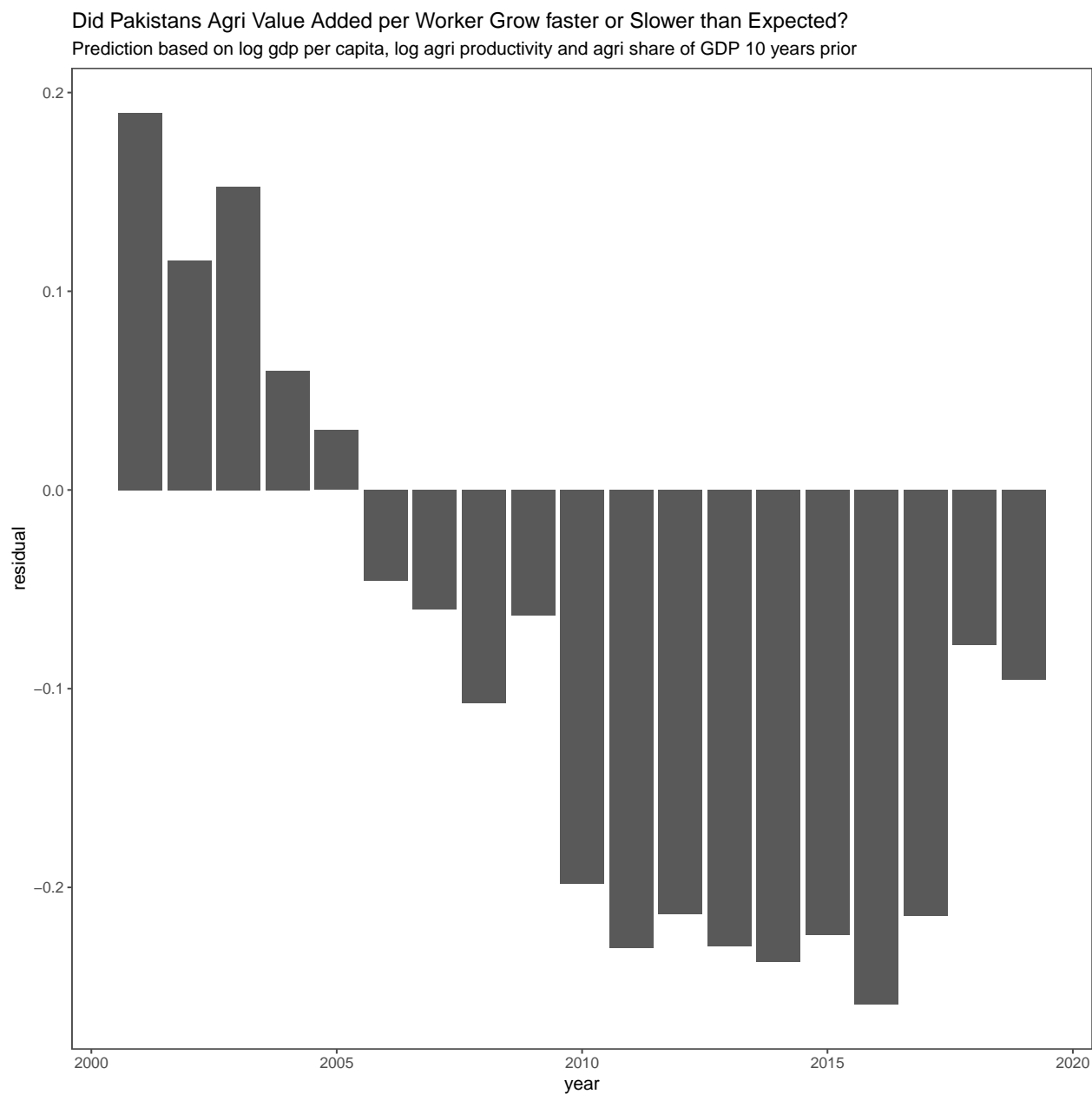


South Asian Value Added in Agriculture per Worker over Time



Growth in Value Added per Worker between 2000 and 2019  
Agriculture in South Asia





## Decomposing Growth in Value Added per Worker

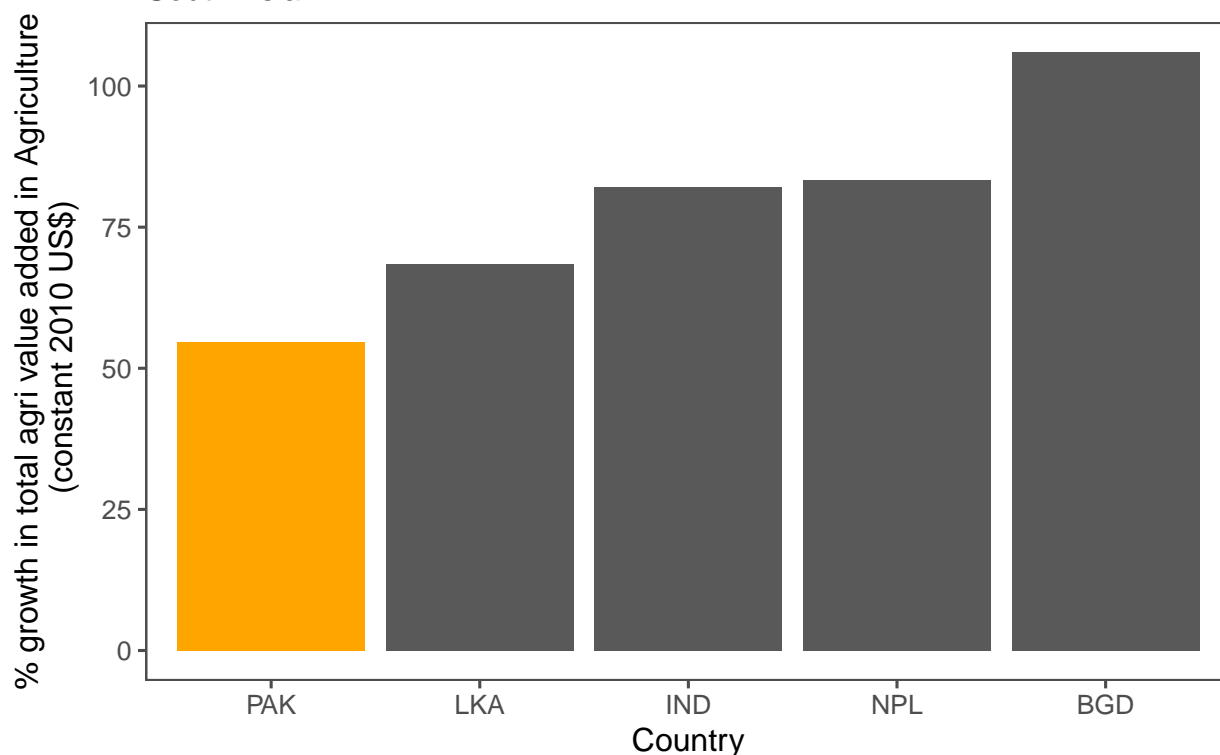
Value added per worker in agriculture is measured as gross output of the sector, minus intermediate costs, and divided by the number of people working in that sector.

Is Pakistans low growth driven by slow growth in value add, or by fast growth in the labor pool, compared to other south asian countries?

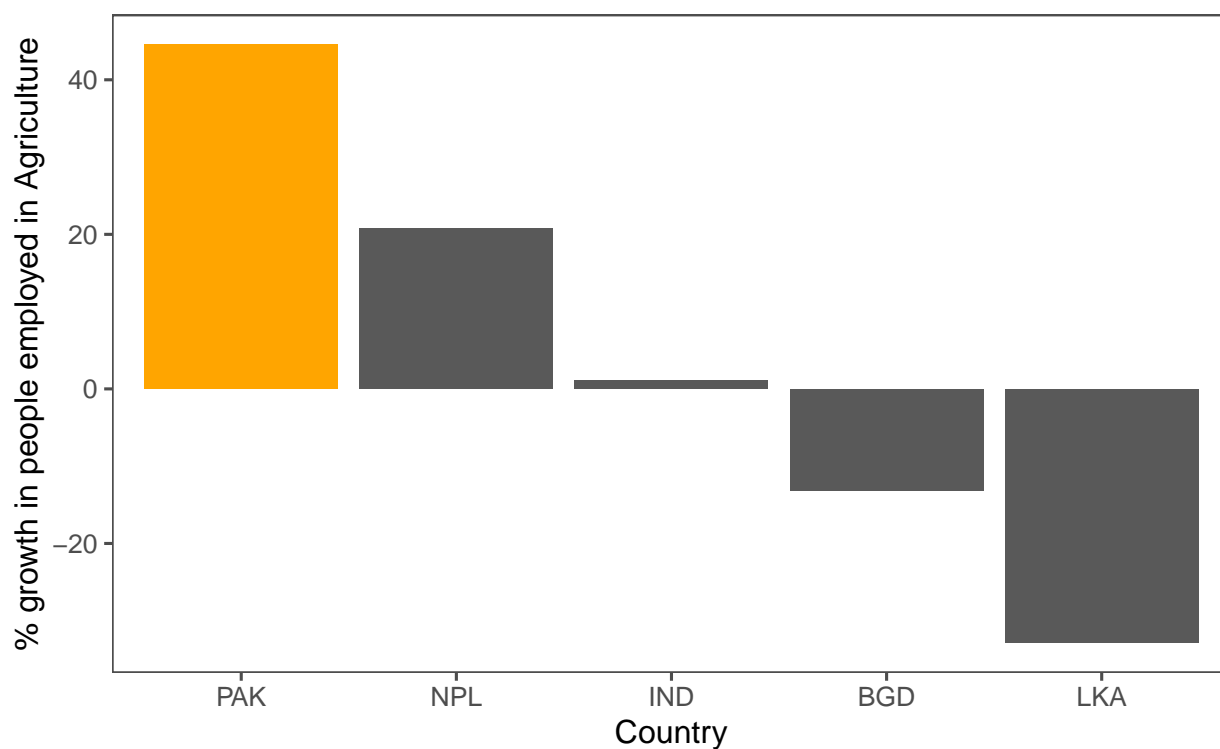
Both. Pakistan had the slowest growth in total agriculture value add between 2000 and 2019 in South Asia. Additionally, Pakistan had the largest growth in total agriculture labor in all of South Asia.

Decomposing the agriculture labor growth, we see that while both male and female labor growth is higher than comparators, female growth significantly outpaces male labor growth.

Percent growth in total agri value added between 2000 and 2019  
South Asia



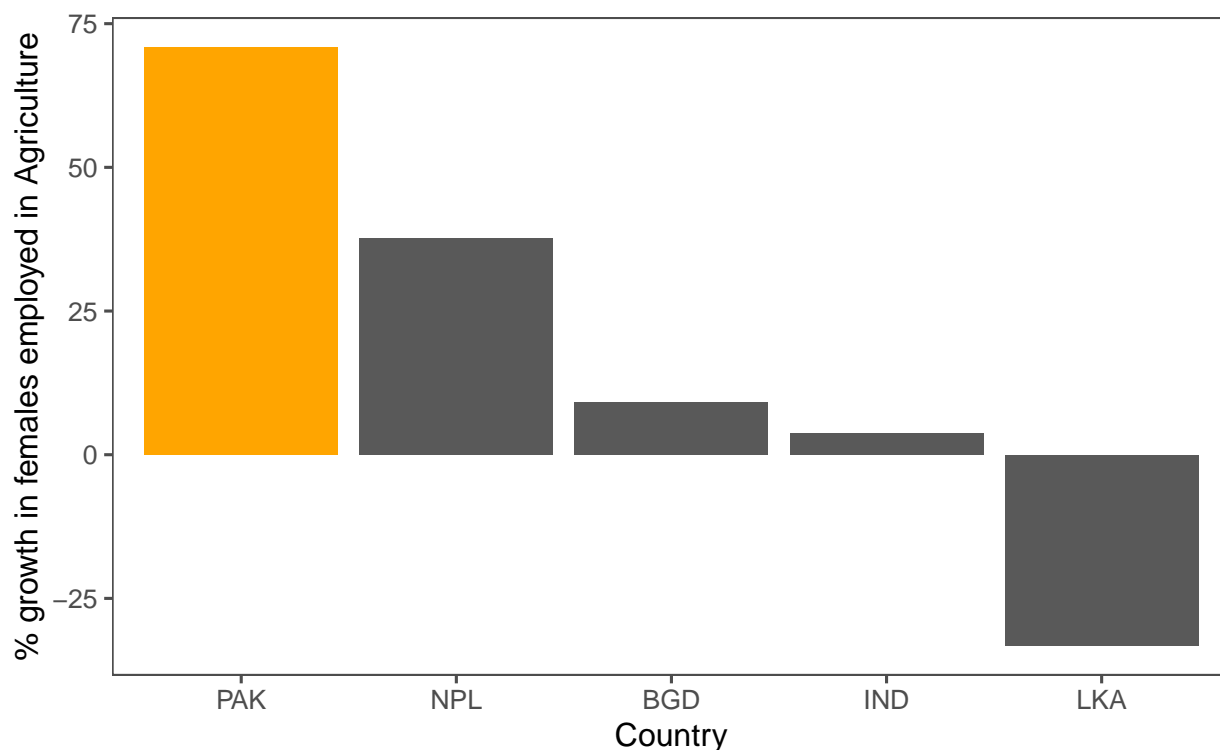
Percent growth in total labor employment between 2000 and 2019  
South Asia



We can decompose the growth in labor between men and women.

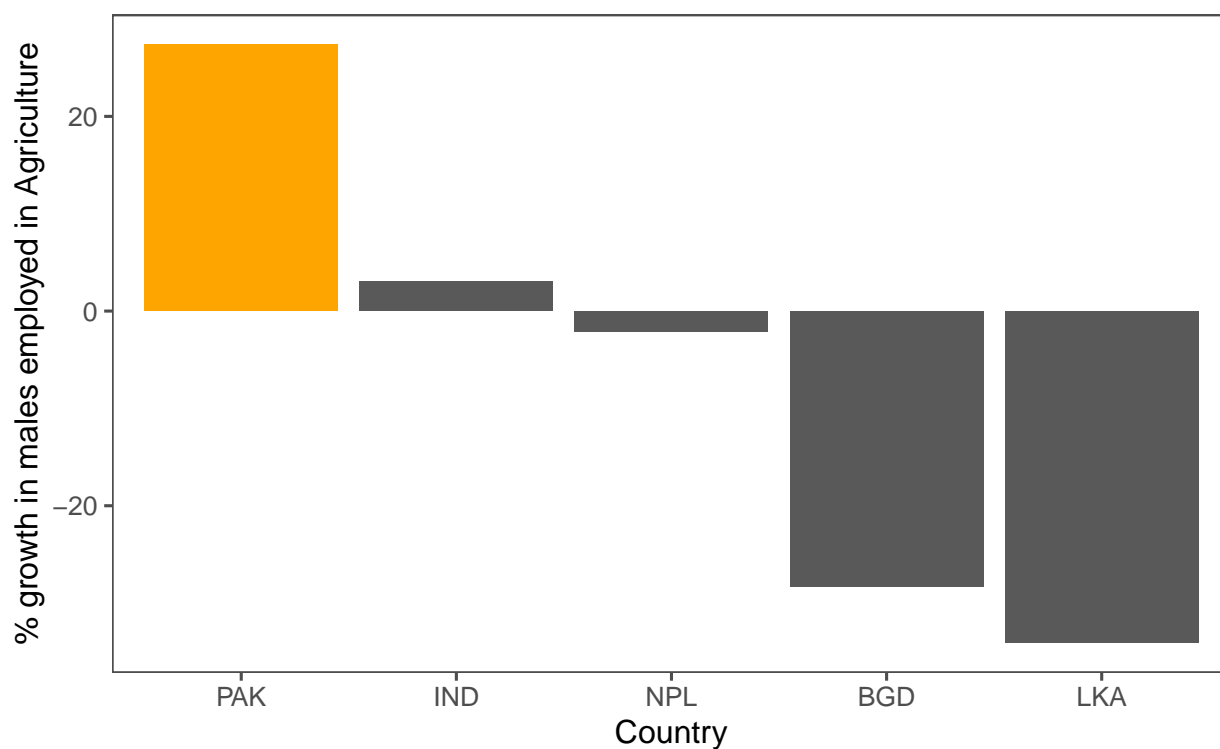
## Percent growth in female labor employment between 2000 and 2019

South Asia



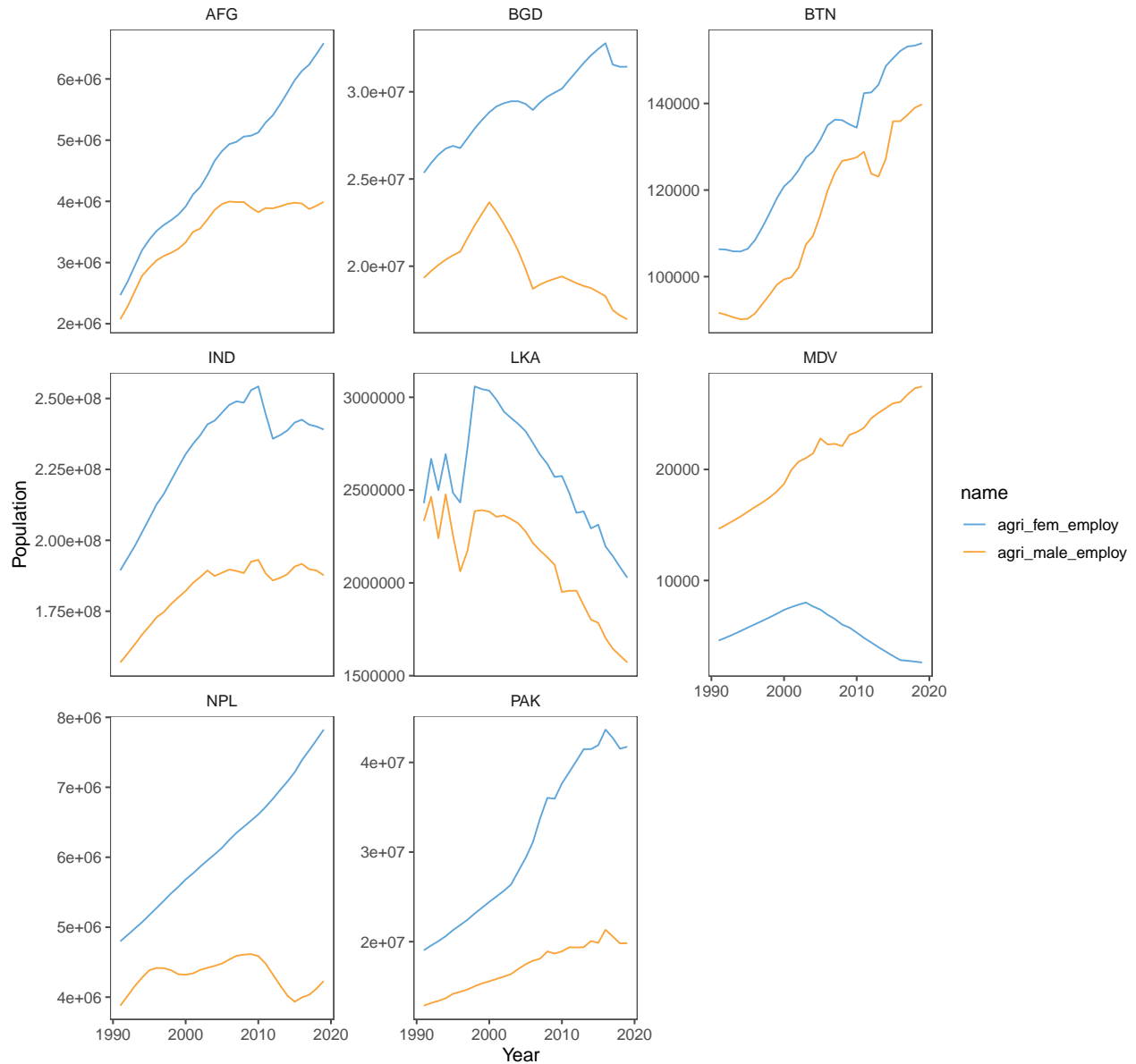
## Percent growth in male labor employment between 2000 and 2019

Agriculture in South Asia



## Female vs Male Employment in Agriculture over Time

### Agriculture in South Asia



## Value Added per Hectare of Arable Land

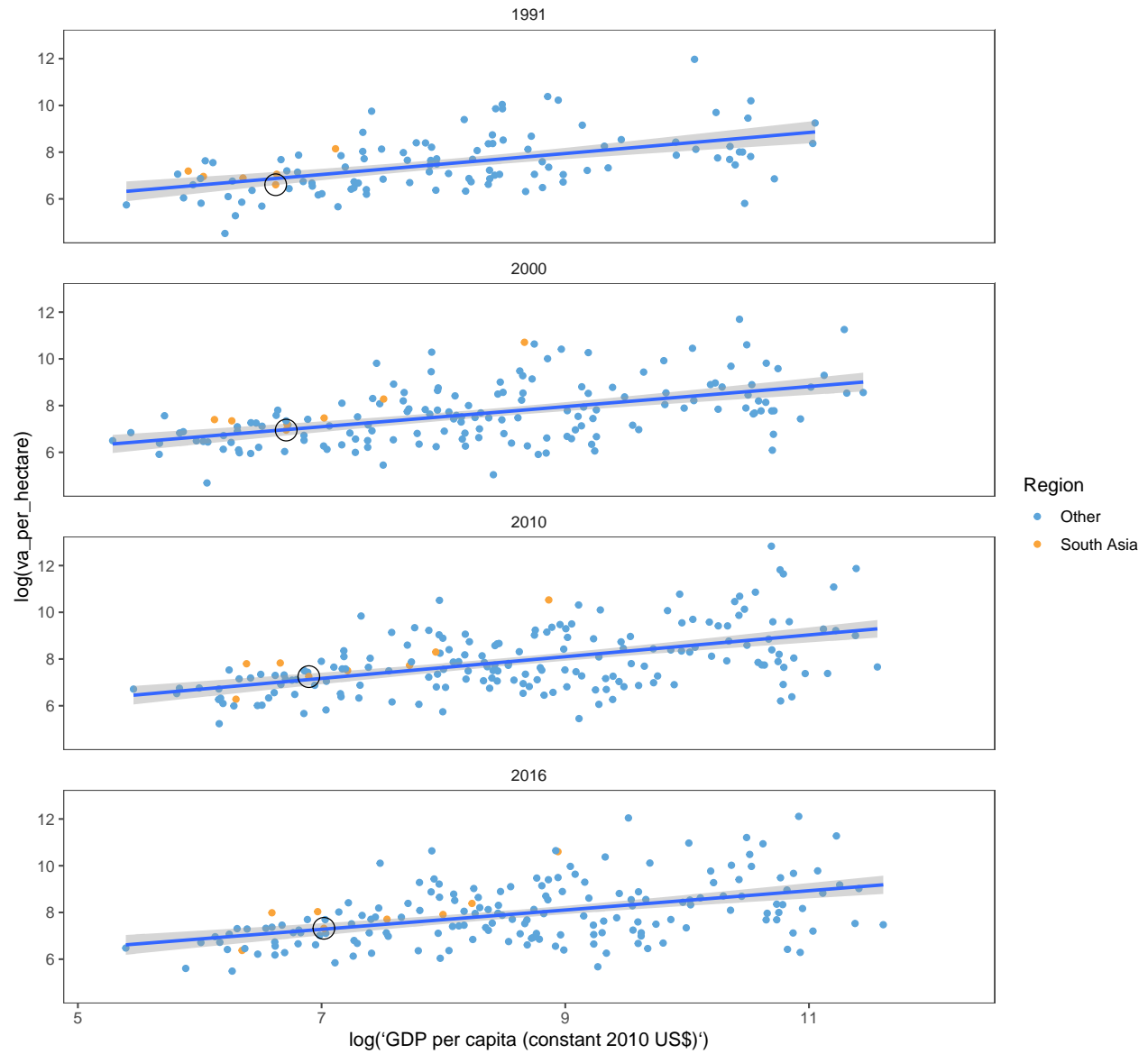
In the world, Pakistan has roughly expected levels of Value Added per Hectare of Arable land for its level of GDP per capita.

However, the next figure shows that Pakistan has the lowest value added per hectare of arable land in all of South Asia, bar Afghanistan.

Growth has also been slow, and it has only been faster than Sri Lanka. Sri Lanka has had a greater growth in value added over this time period, and has slower growth in this metric due to a 40% increase in the amount of Arable land over the period.

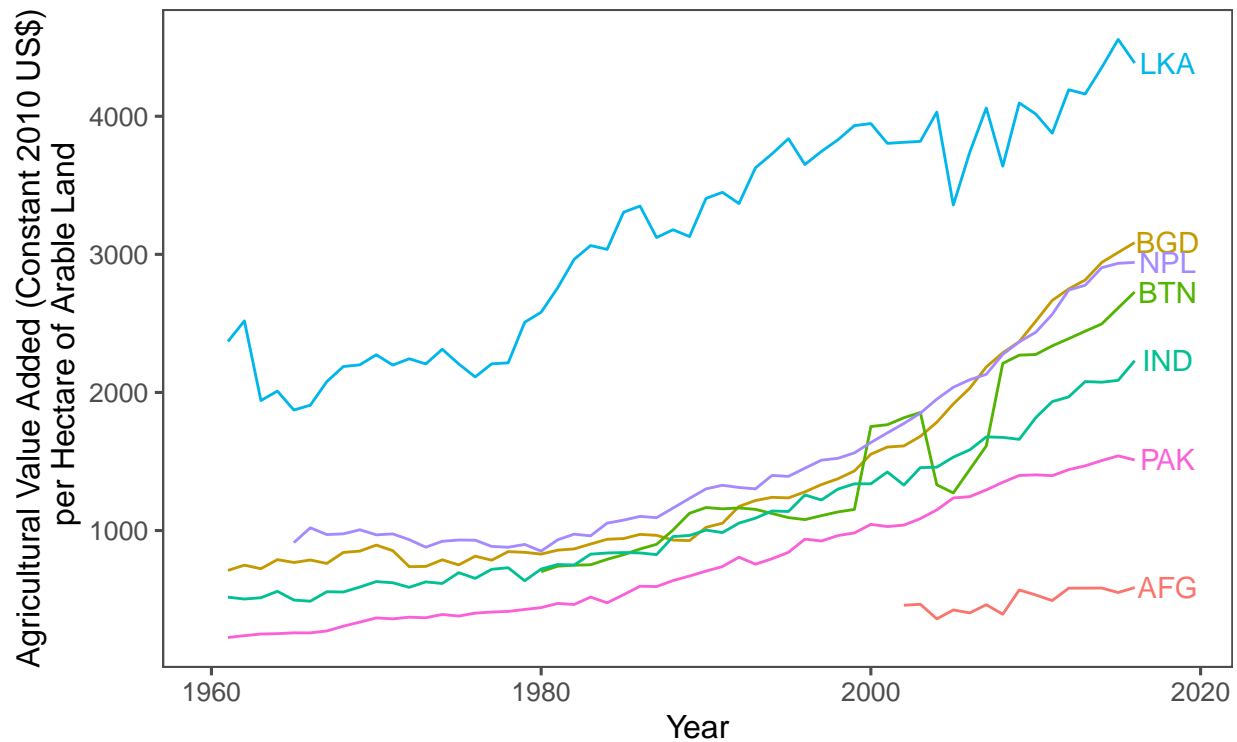


# Comparing Agricultural Value Added per Hectare of Arable Land Pakistan circled

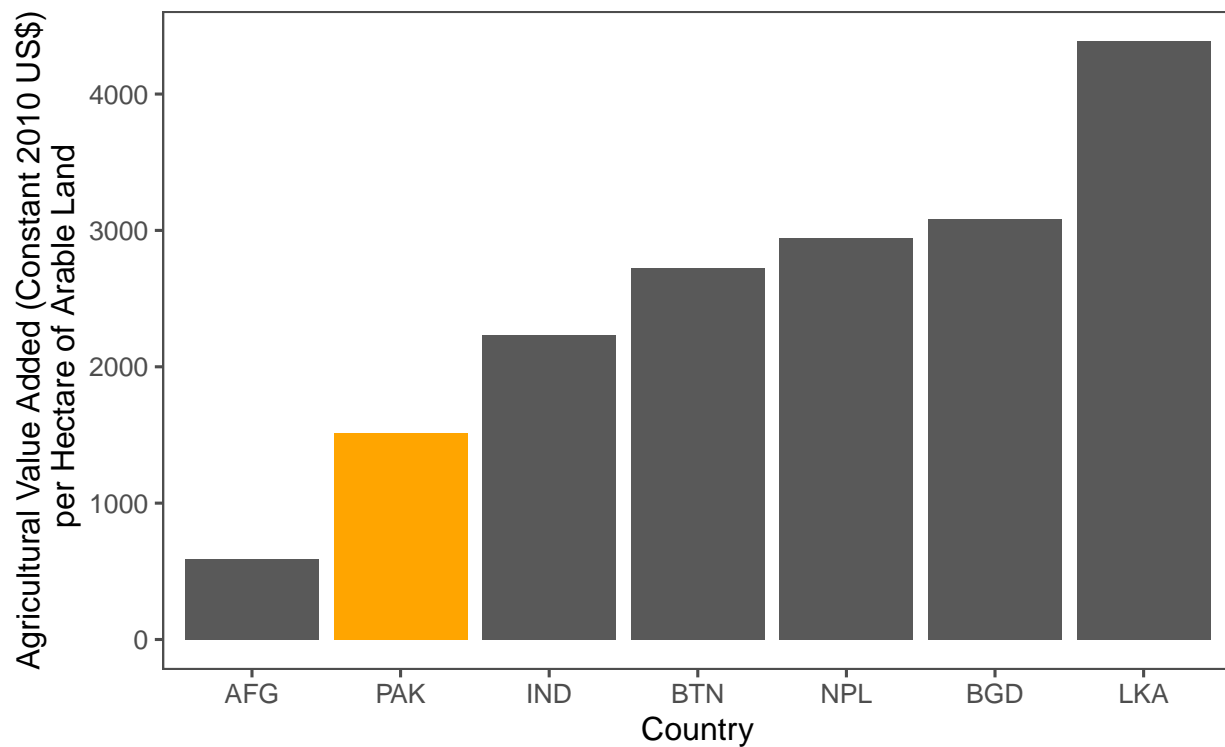


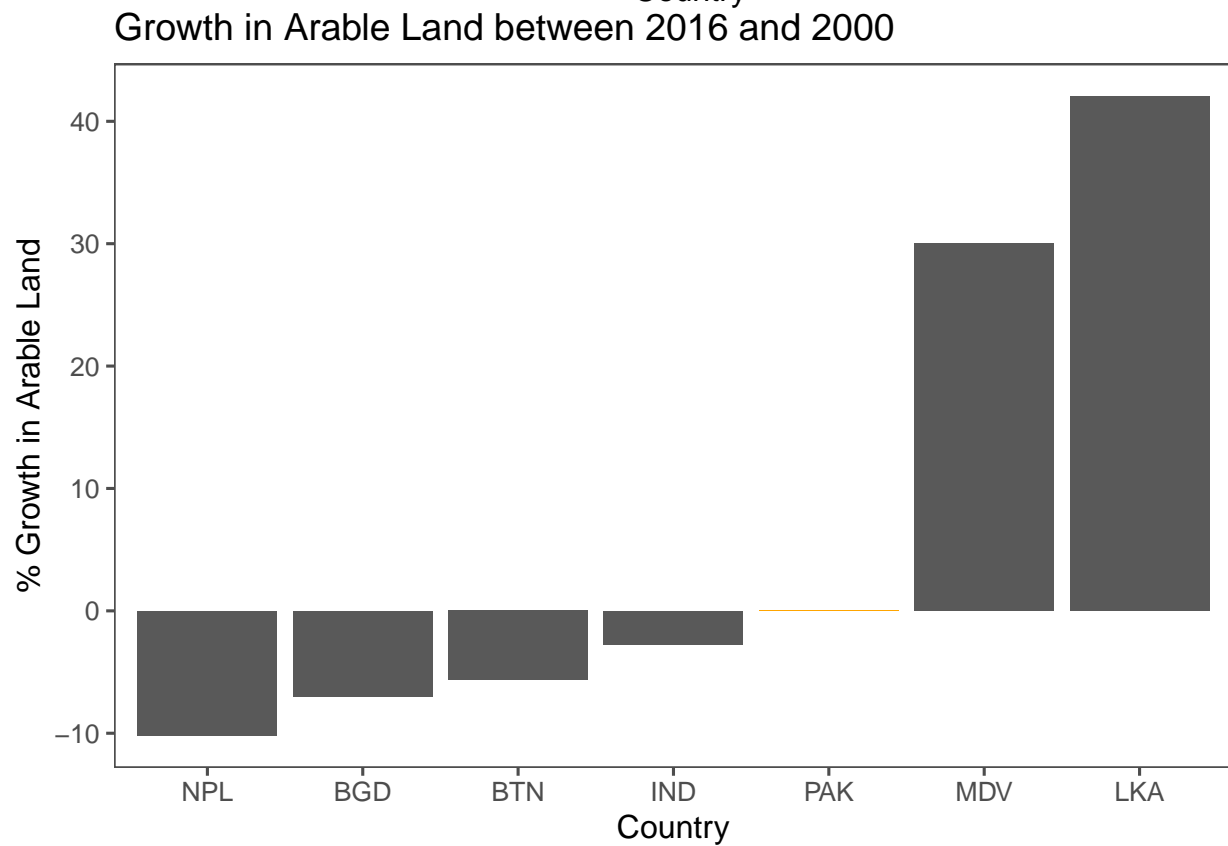
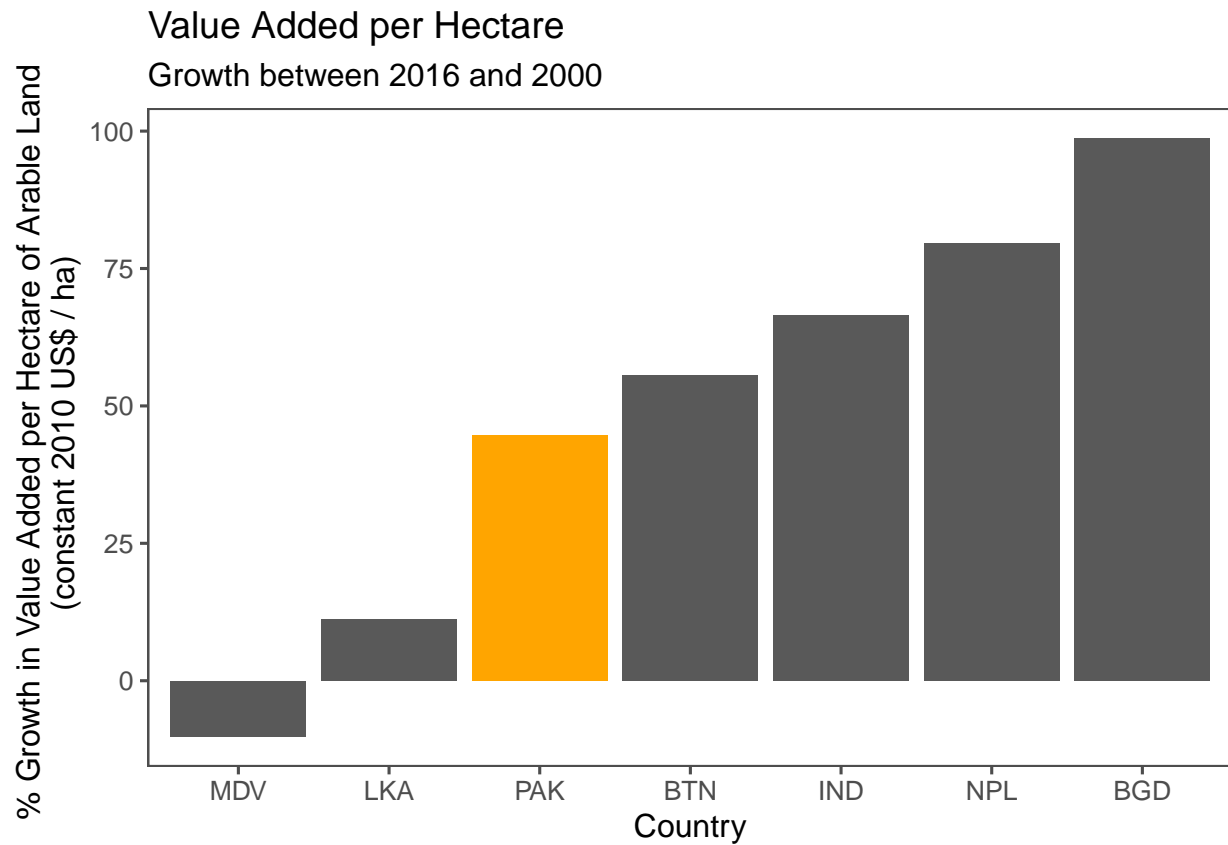
Source: World Bank

Agriculture Value Added per Hectare of Arable Land  
South Asia



Agriculture Value Added per Hectare of Arable Land  
South Asia





## Next Steps

We have seen that both the value added growth is slower than comparators, and that L is increasing much faster than comparators.

There is significant room to increase the value added in agriculture. And this may be the problem to fixate on for now. Even with all these extra workers, who maybe cannot find a job in the industrial sector, we cannot boost the value added. Even if an 'average' number of people instead had shifted to work in industry, the value added would be lower compared to other countries.

We see that Pakistan has the least productive land in South Asia, other than Afghanistan. Is this true at a subnational level as well? Why is it so unproductive? Can we get variation in district-level land productivity? What drives that variation?

Is Pakistan growing the wrong crops? Maybe the quantity being produced on the land is actually growing over time, but the prices are falling. For some reason, farmers are not switching to better crops. Todo: rule out a price effect so that we can focus on quantity questions.

Are people using the wrong mix of inputs, driving lower quantities? Can we see this at a macro level?

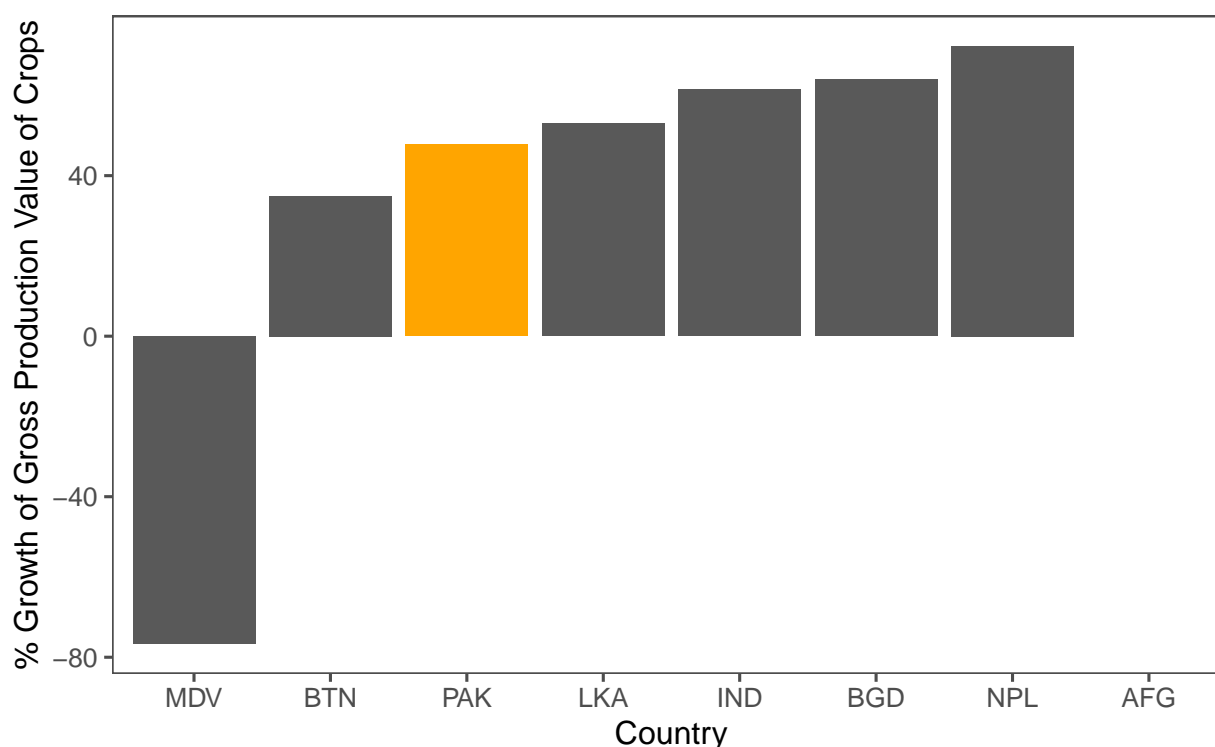
Are intermediate costs rising for some reason, far more than in other countries? What are the intermediate costs? How does FAO / the world bank take them out?

Other notes:

According to this data, there are almost 2x as many women working in agriculture than men. I am curious what this actually means - do they only do particular jobs, work on particular crops? Maybe interventions need to target increasing the productivity of women in Agriculture.

## Gross Crop Production Patterns

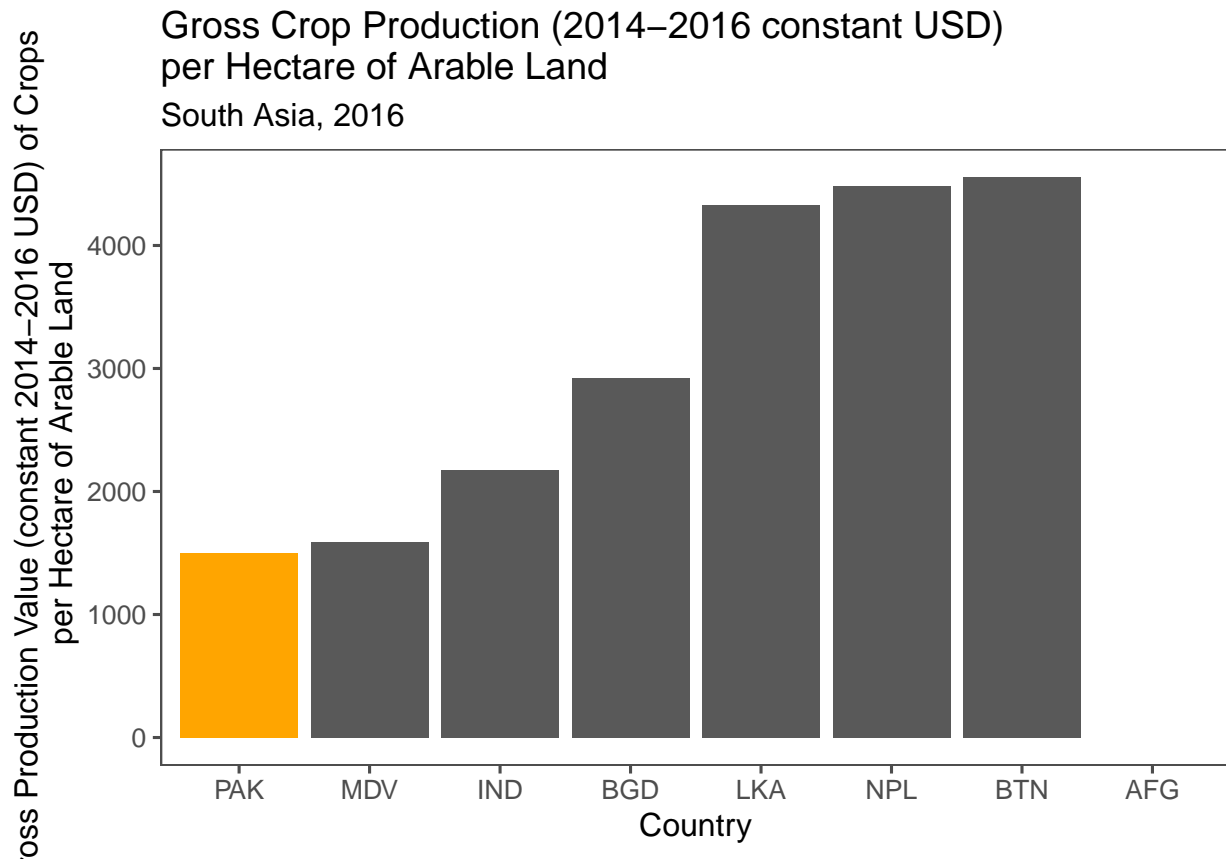
% Growth of Gross Crop Production (constant 2014–2016 US\$)  
South Asia, 2000–2016



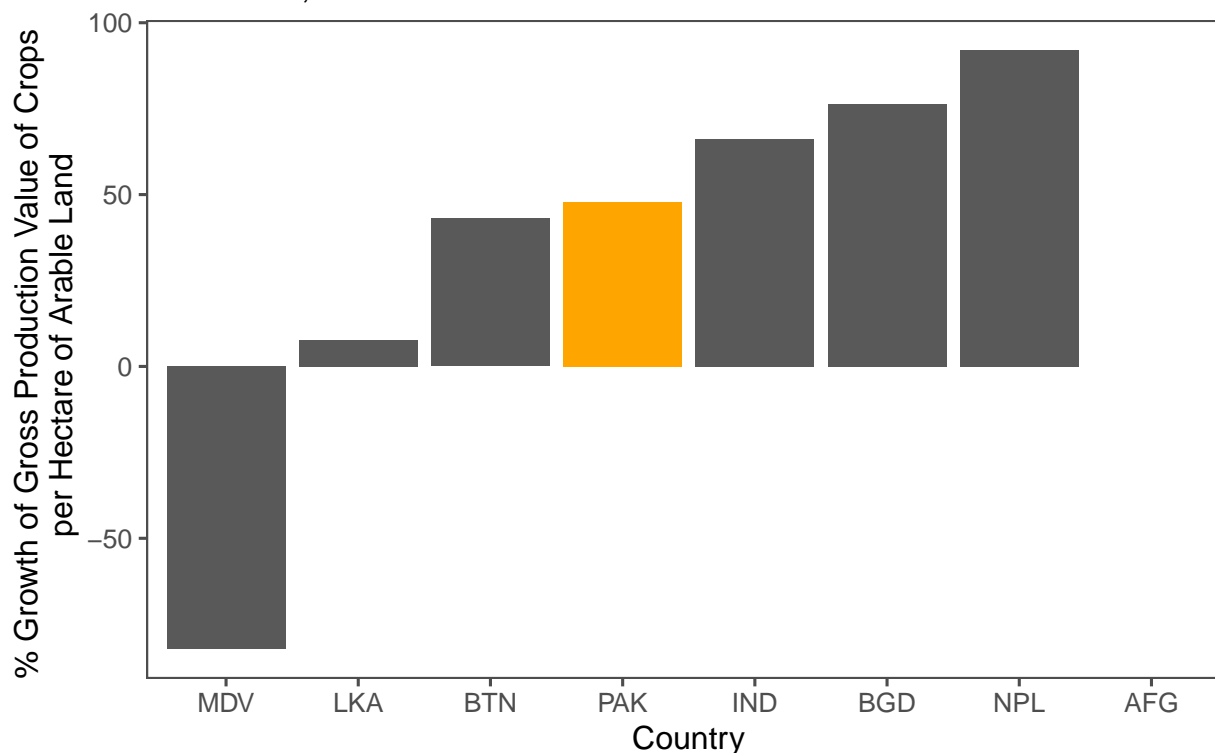
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## [5] "adminregion" "incomelevel"
## [7] "Agri GDP Share" "Agri Value Added (current US$)"
## [9] "Agri Value Added (constant 2010 US$)" "GDP per capita (constant 2010 US$)"
## [11] "Agri Employment" "Agri Female Employment"
## [13] "Agri Male Employment" "pop-working-age"
## [15] "population" "pop-working-age-female"
## [17] "pop-working-age-male" "pop-working-age2"
## [19] "Agricultural Land" "Arable Land"
## [21] "Cereal yield" "Irrigated Land"
## [23] "Irrigated Land2" "agri_employ"
## [25] "agri_prod" "agri_fem_employ"
## [27] "agri_male_employ" "va_per_hectare"
## [29] "gross_prod_per_ha" "prev_gross_prod"
## [31] "prev_gross_prod_per_ha" "gross_prod_growth"
## [33] "gross_prod_per_ha_growth"

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% Growth of Gross Crop Production per Hectare of Arable Land  
South Asia, 2000–2016

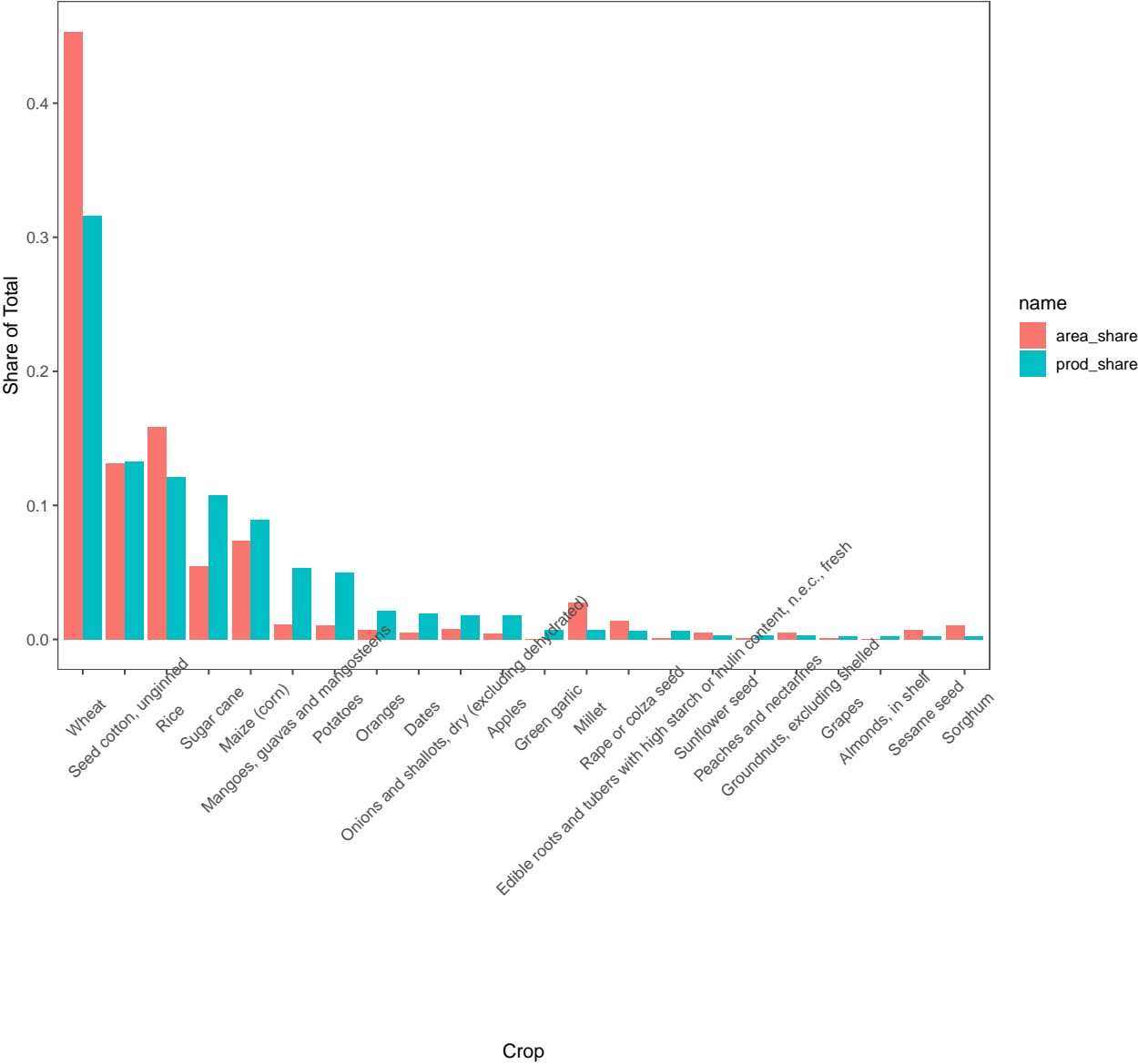


The crop data confirms that just looking at crop production, Pakistan is low gross output for its level of arable land. Growth is also not great.

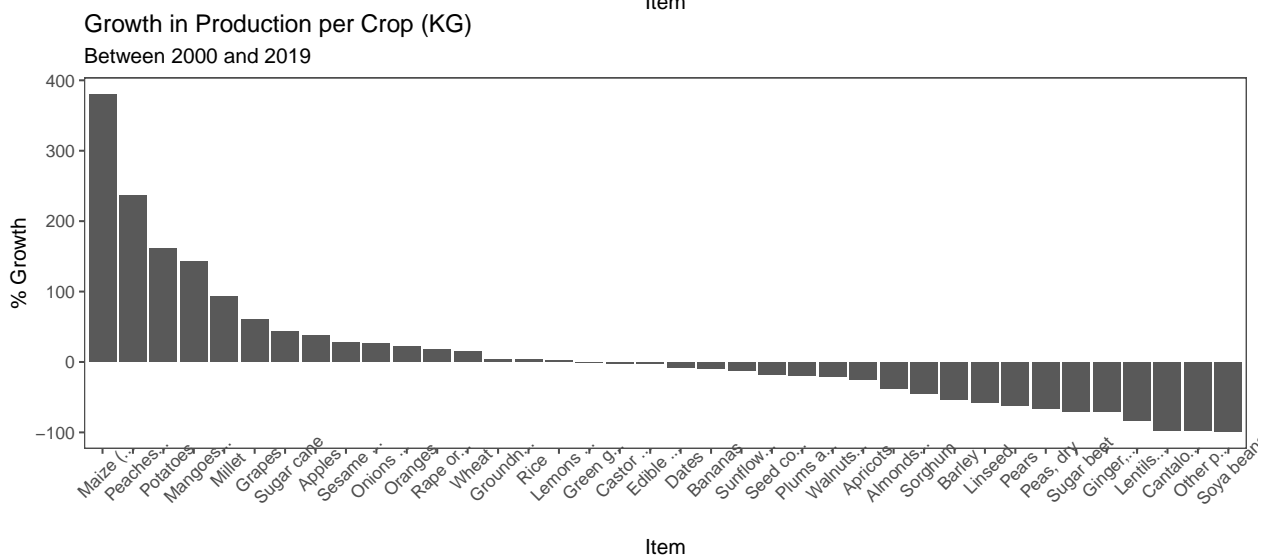
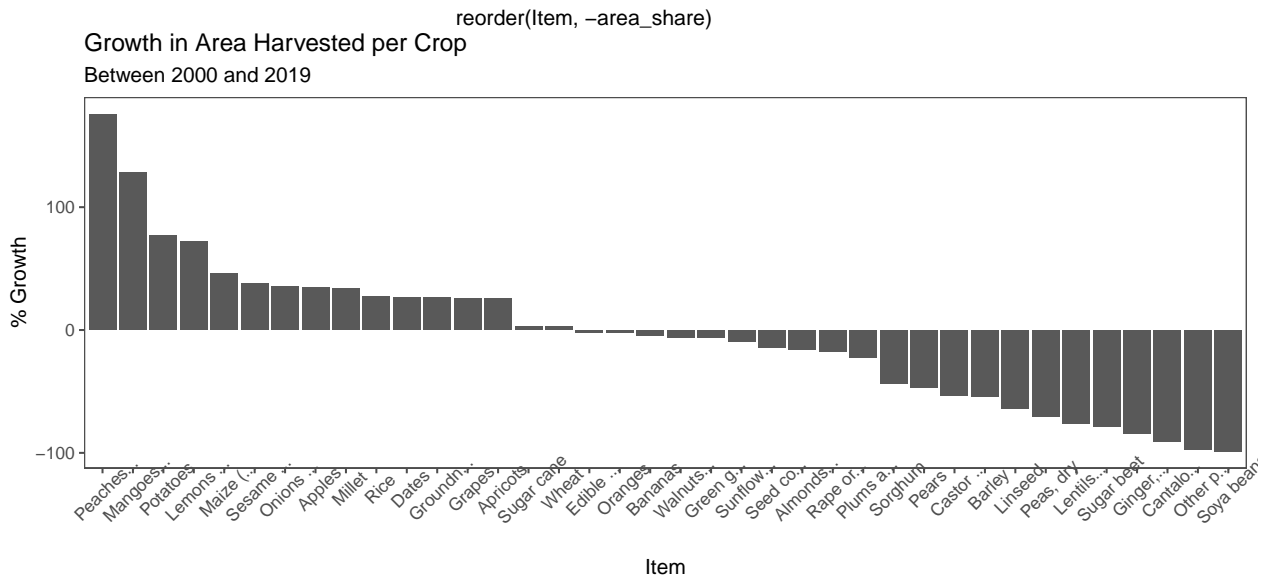
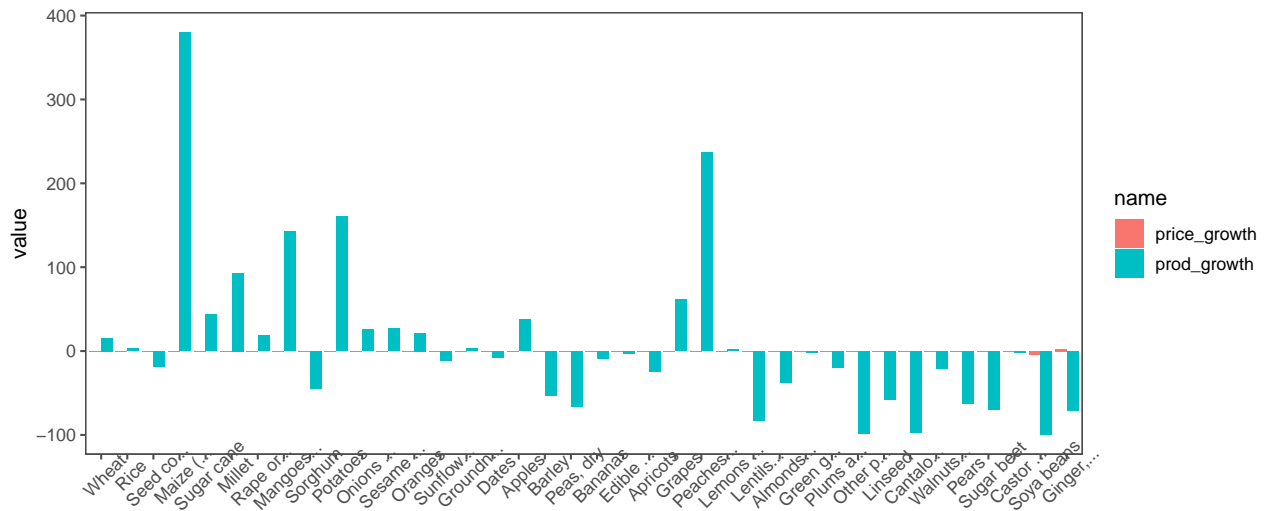
Now, we can start to look at per crop, the land allocated to it, and the money squeezed out. We should look at things like the concentration of crops in each. The top n crops for Pakistan, how has their production per hectare changed over this time period? How does that relate to others in South Asia?

For each crop, how much of the growth was driven by price changes? Each crop has gross production, change in land, change in price.

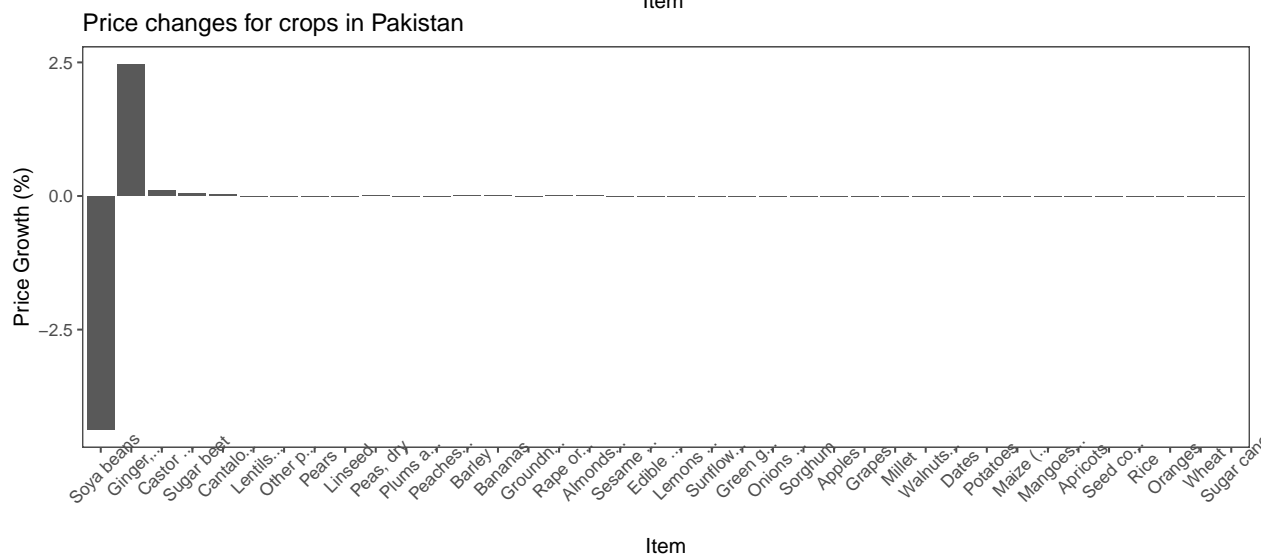
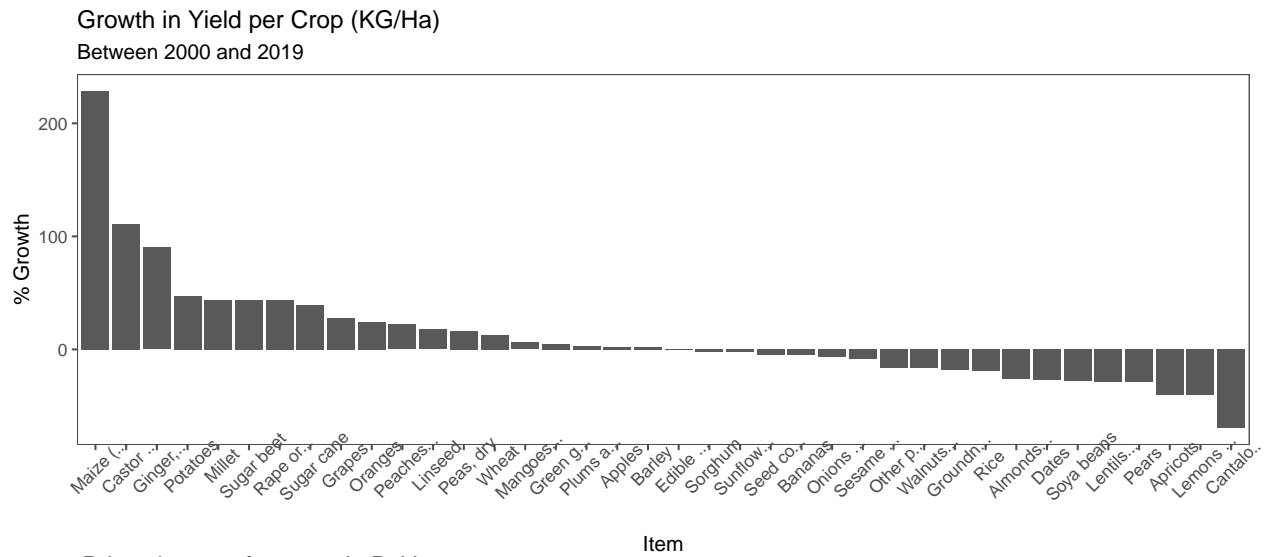
Area and Production share for crops in Pakistan  
Year: 2019



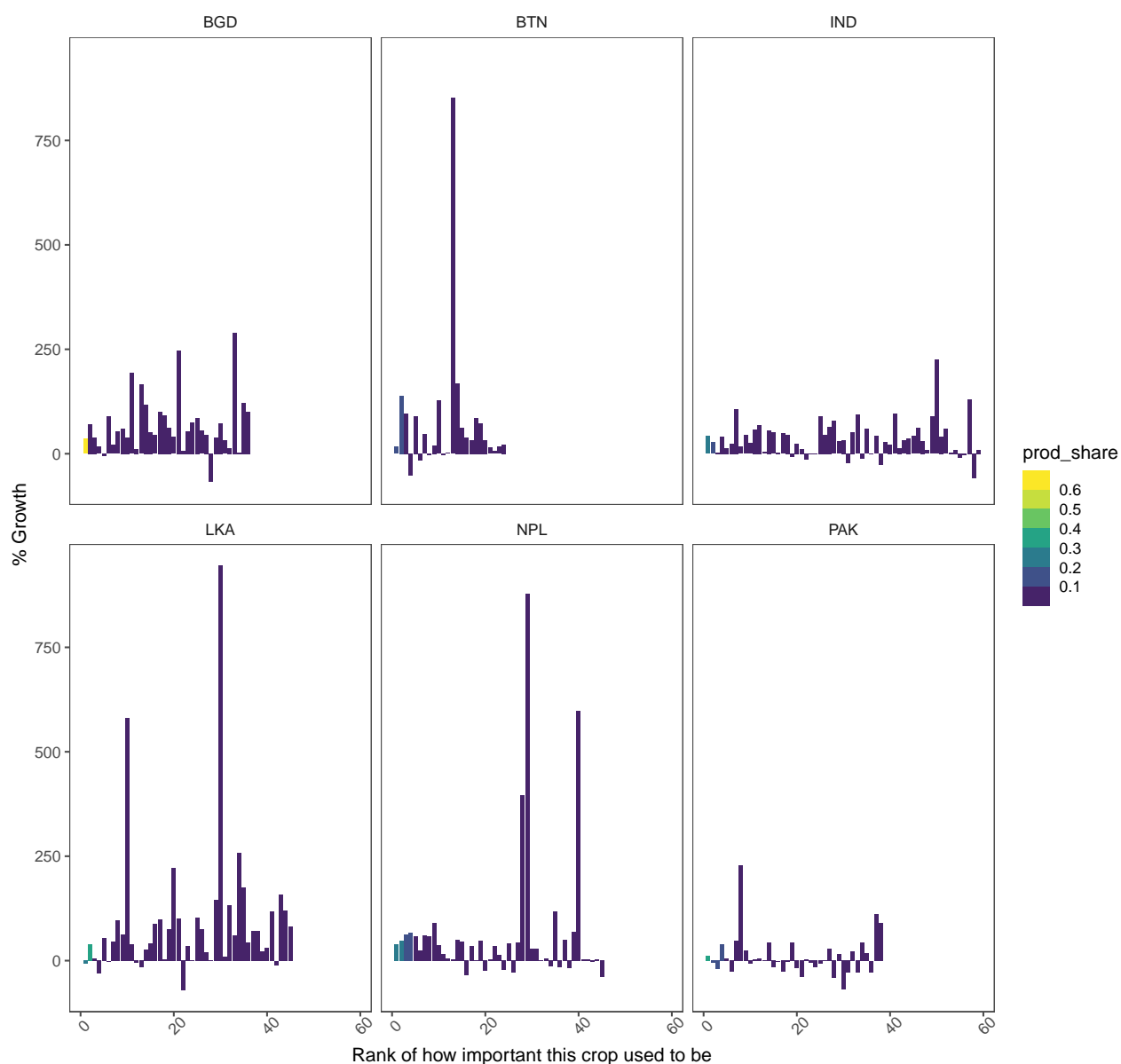
Source: FAOSTAT







Growth in Yield per Crop (KG/Ha)  
Between 2000 and 2019

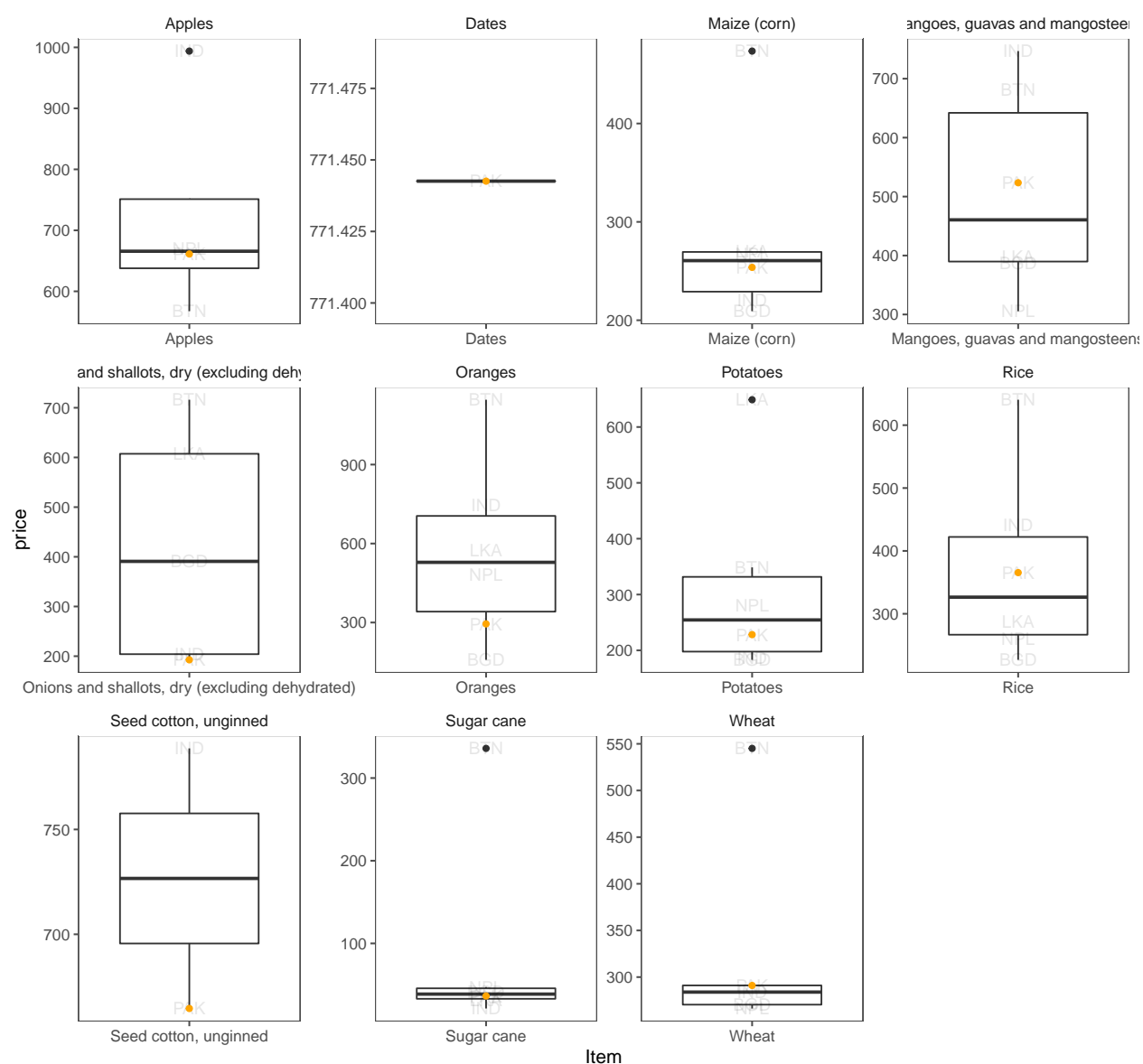


Item	Production Rank-ing	Prod Share	Area Share	Prod Share Growth	Area Share Growth	Yield Growth	Avg Yield Growth	Rel Price	Econ Yield Growth	Prod Growth	Area Growth
Maize (corn)	5	8.9	7.3	290.2	39.7	228.6	162.3	1.0	228.6	379.7	46.0
Potatoes	7	5.0	1.0	112.0	69.3	47.2	46.9	0.9	47.2	160.6	77.1
Mangoes, guavas and mangosteens	6	5.3	1.1	96.9	118.3	6.1	6.1	1.1	6.1	142.1	128.2
Sugar cane	4	10.8	5.4	16.5	-1.5	39.1	5.2	0.9	39.1	43.3	3.0
Apples	11	1.8	0.4	11.9	28.7	2.2	33.5	1.0	2.2	37.6	34.6
Onions and shallots, dry (excluding dehydrated)	10	1.8	0.8	2.6	29.2	-6.6	58.3	0.5	-6.6	26.2	35.1

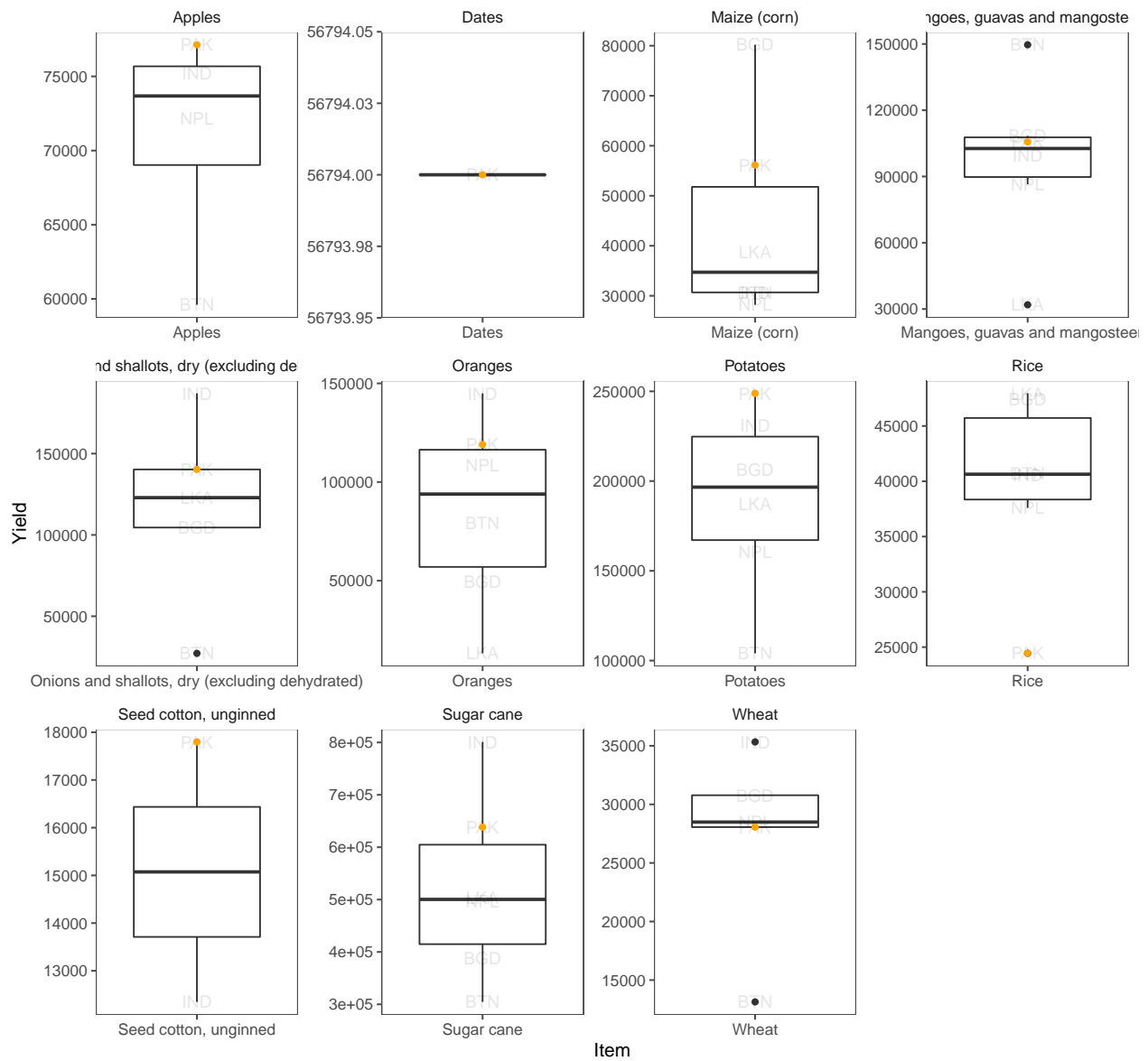
Item	Production Rank- ing	Prod Share	Area Share	Prod Share Growth	Area Share Growth	Yield Growth	Avg Yield Growth	Rel Price	Econ Yield Growth	Prod Growth	Area Growth
Oranges	8	2.1	0.7	-1.1	-6.6	24.6	20.5	0.6	24.6	21.6	-2.4
Wheat	1	31.6	45.3	-6.0	-1.9	12.7	38.9	1.0	12.7	15.5	2.5
Rice	3	12.1	15.9	-16.3	22.1	-19.4	39.3	1.1	-19.4	2.9	27.7
Dates	9	1.9	0.5	-25.0	21.1	-27.1	-27.1	1.0	-27.1	-7.8	26.6
Seed cotton, unginned	2	13.3	13.2	-33.4	-17.8	-4.9	50.8	0.9	-4.9	-	-
										18.2	14.0

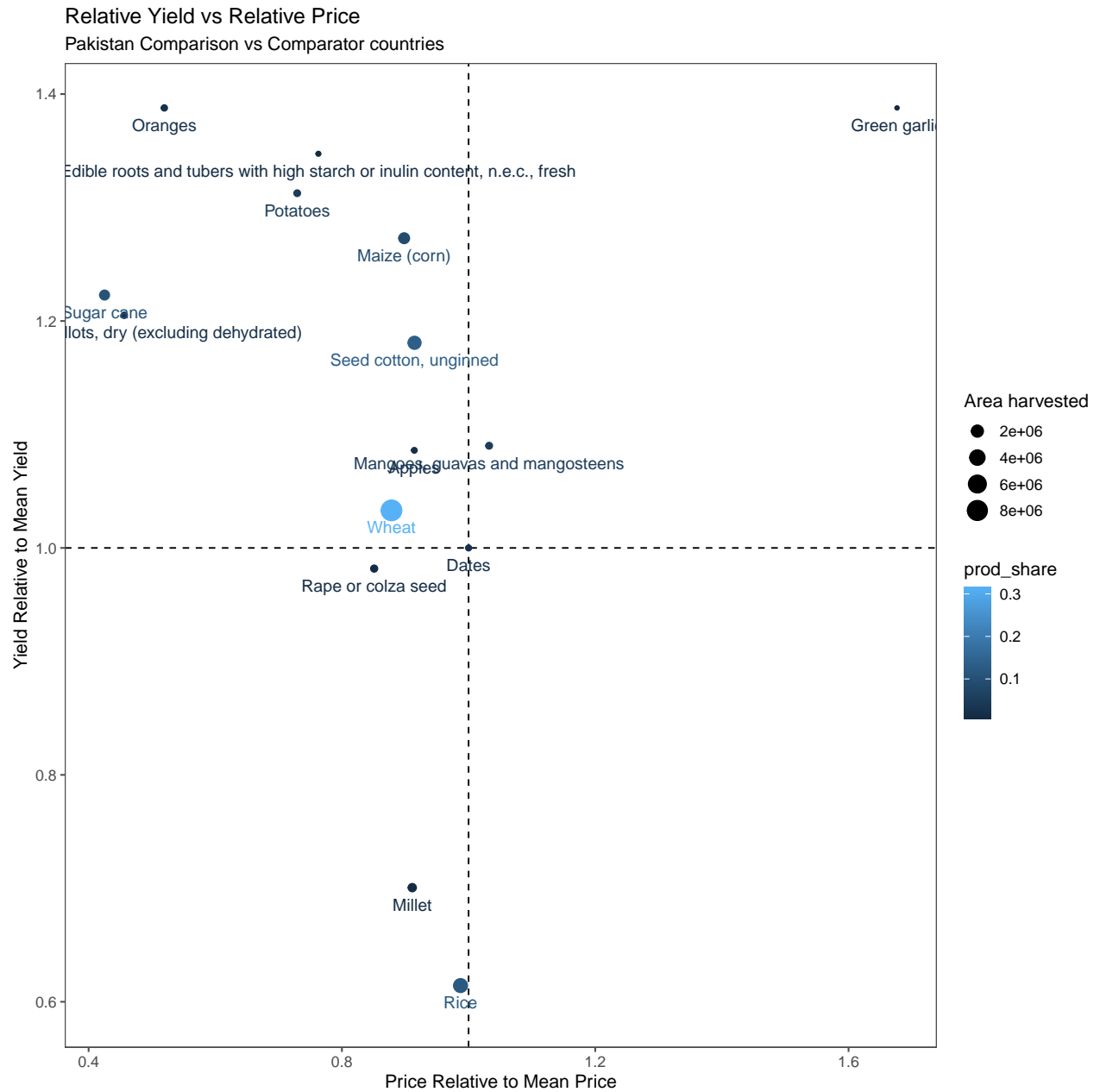
Lets look at prices of crops relative to others.

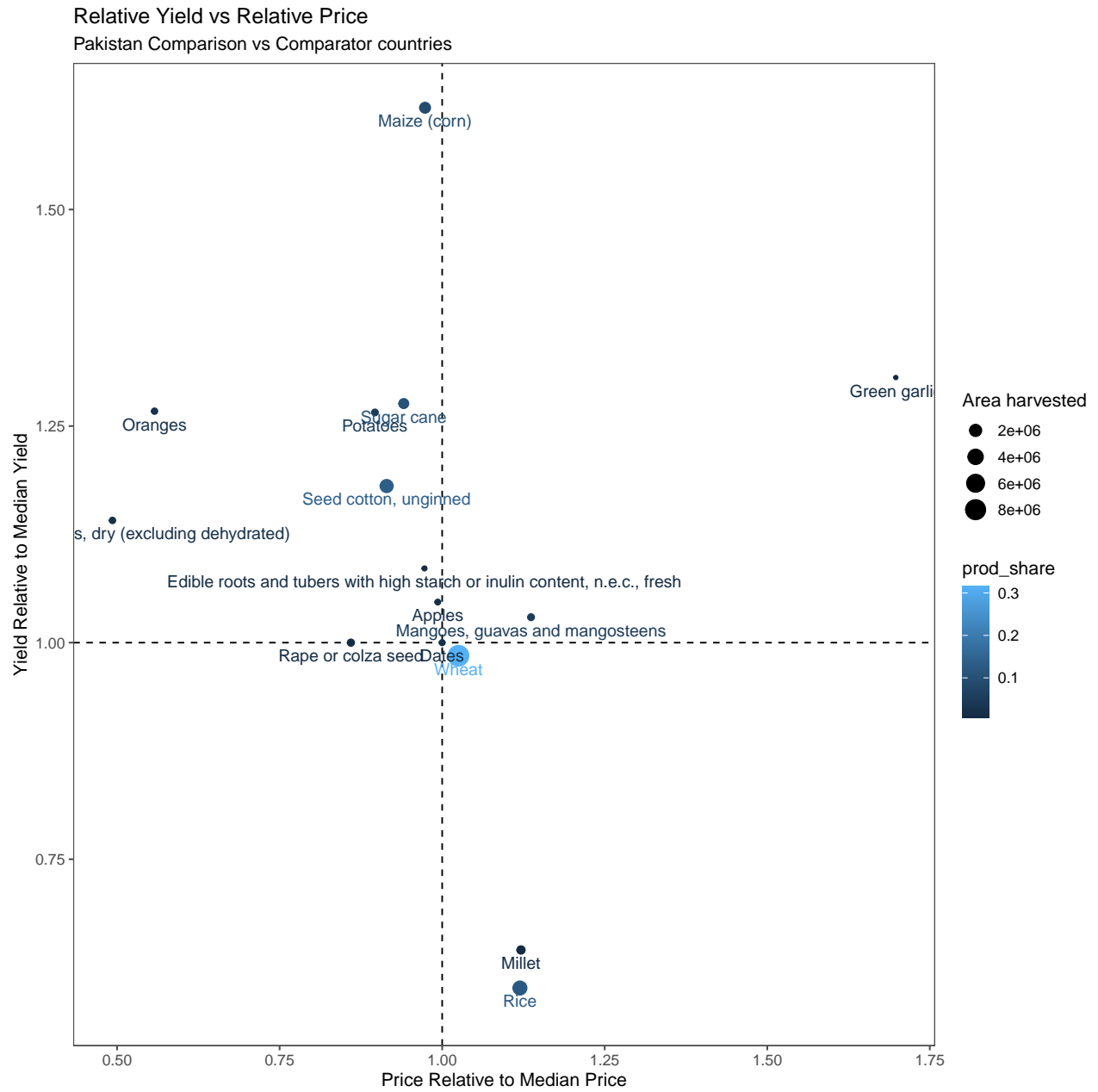
### Pakistans Place in Price Distribution for Major Crops 2019



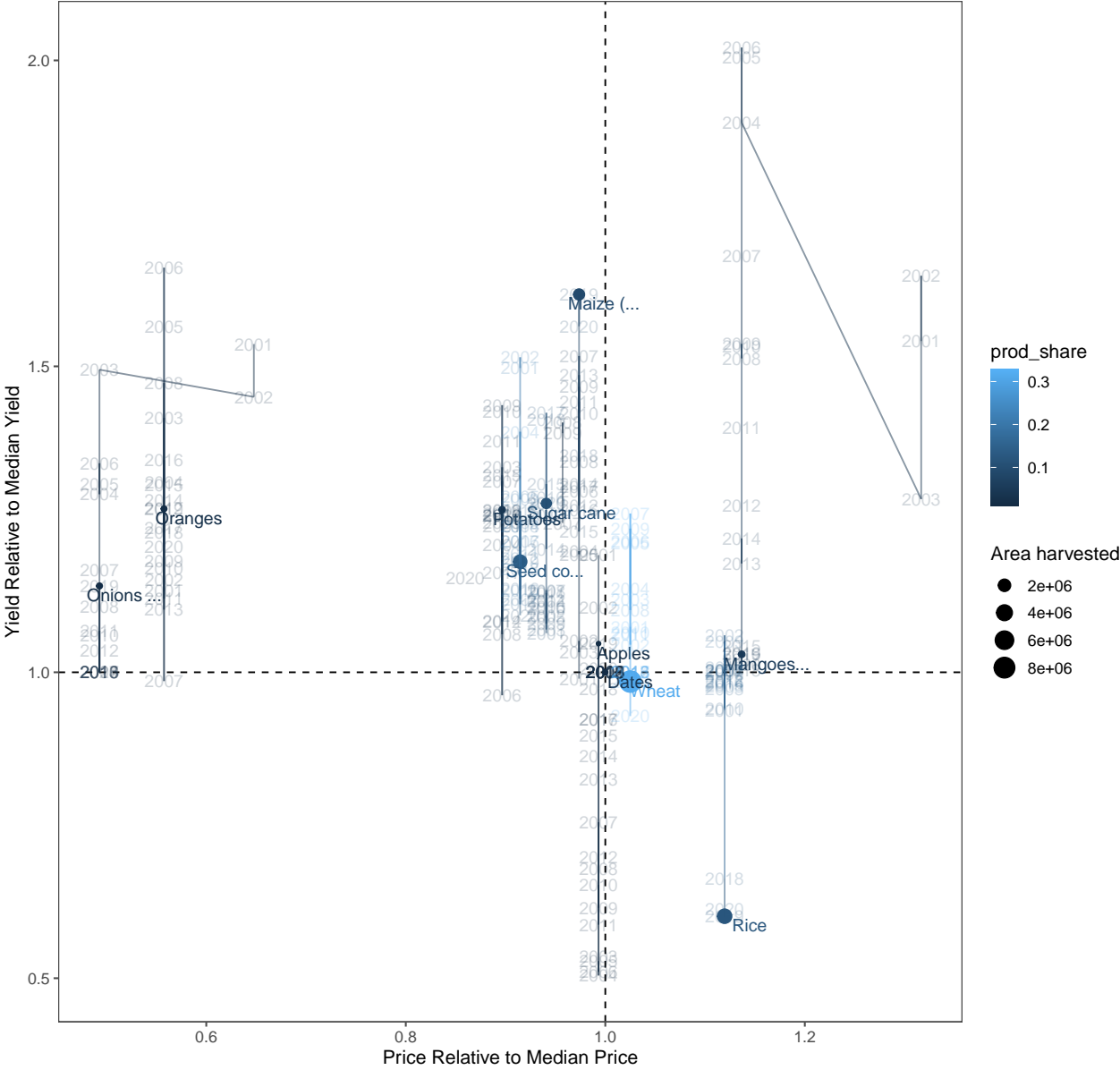
## Pakistans Place in Yield Distribution for Major Crops 2019

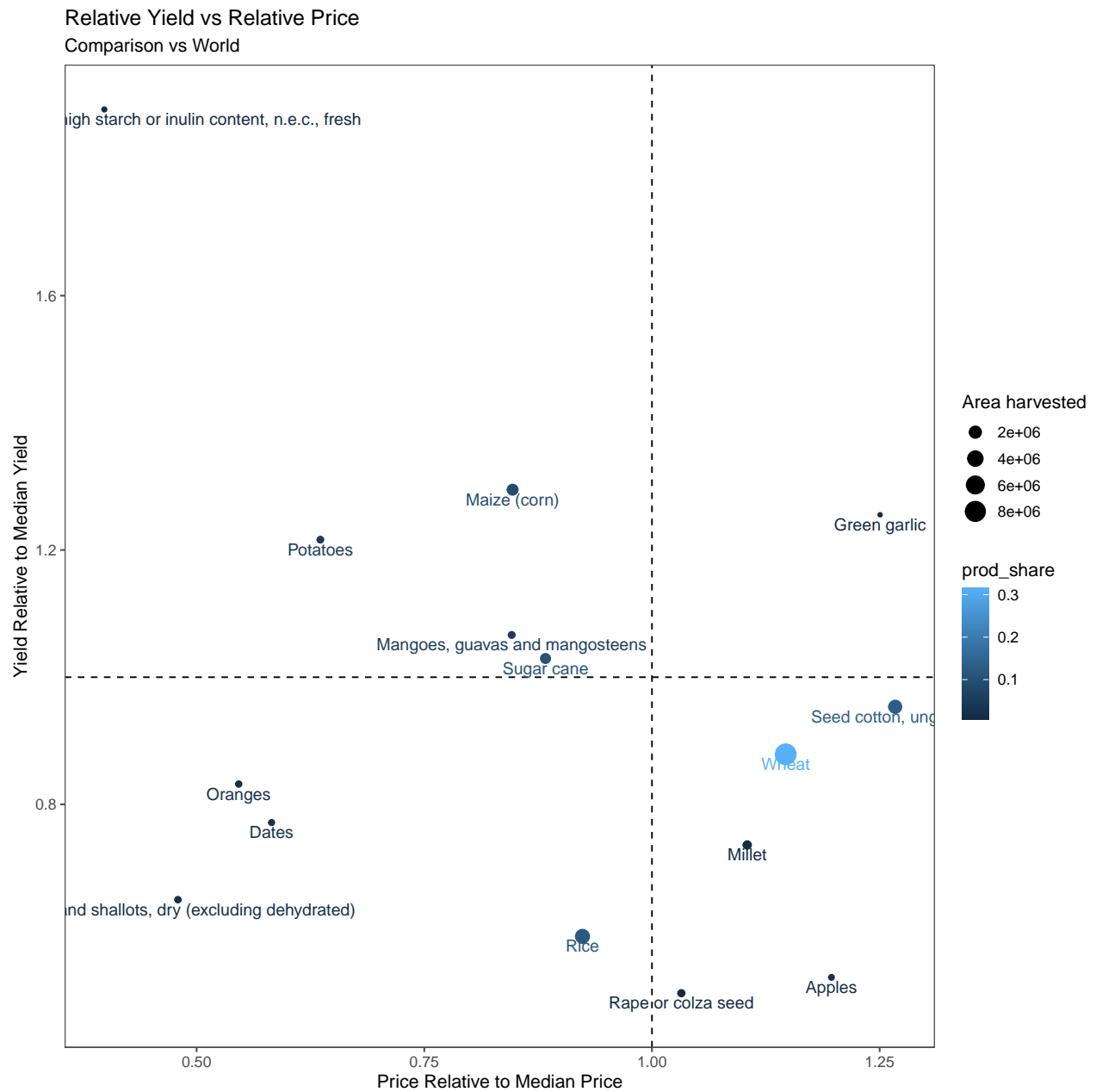






Relative Yield vs Relative Price  
Comparison vs Comparator countries





## Appendix

Below I got curious about the relationship between concentration in crops



Area and Production share for crops in South Asia  
Year: 2019

