

Cost of Production

A Global challenge

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ICAC



**International Cotton
Advisory Committee**

DECEMBER 2019

**ICAC
COTTON DATA BOOK
2020**

**ICAC COTTON
DATA BOOK 2020**

December 2019

A Report by the
Technical Information Section of the
International Cotton Advisory Committee



Washington DC, USA

COUNTRY DATA: VARIETIES, SOILS, INPUTS, PESTS etc.,

AUSTRALIA

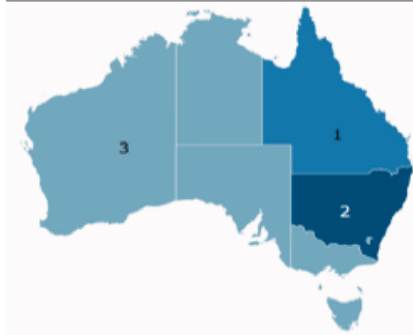
DATA ON THE COTTON SECTOR



BASIC DATA 2019

PRODUCTION 2019 (Forecast)

	Area 000 ha	Production 000 Tonnes
1 New South Wales	100	208
2 Queensland	45	86
3 West Australia	2	4
	147	298



AGRL AREA
382,916
'000 Hectares

COTTON AREA
147
'000 Hectares

PRODUCTION
298
'000 Tonnes

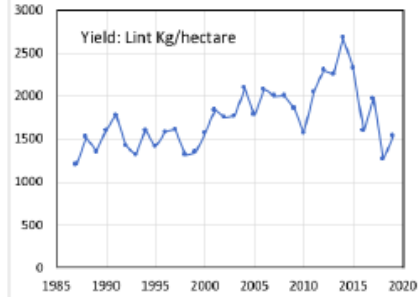
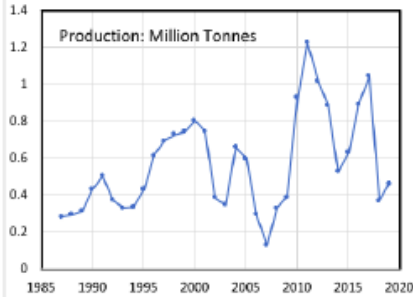
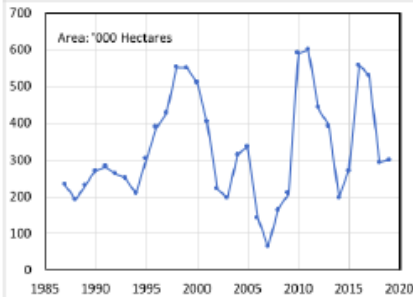
LINT YIELD
2,027
Kg/ Hectares

CONSUMPTION
32
'000 Tonnes

LINT EXPORTS
367
'000 Tonnes

FARMERS
1,350
MALE

FARMERS
540
FEMALE



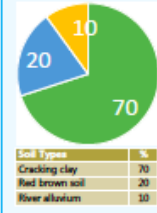
VARIETIES & FIBRE TRAITS

NSW & QUEENSLAND	Release Year	Area (%)	GOT (%)	Length mm	Strength g/tex	Mic	Sowing	Picking
Sicot 714B3F	2016	17	42.0	30.5	30.0	4.4	September	April
Sicot 746B3F	2016	40	45.0	30.7	30.0	4.5	September	April
Sicot 748B3F	2016	40	44.0	31.2	31.0	4.5	September	April

SEEDS & PLANTING

TILLAGE %		SEED PROCESSING %		SEED DRESSING %		PLANTING METHOD %	
90	0	0	100	100	0	0	100
ZERO	ANIMAL	FUZZY	DELINTED	TREATED	UNTREATED	MANUAL	MACHINE
SEED SOURCE %		SEED RATE	SPACING (cm)		PLANT POPULATION		
100	0	12	90	10	111,110		
LOCAL	IMPORTED	Kg/Ha	INTER-ROW	INTRA-ROW	PLANTS/Ha		

SOIL TYPES %



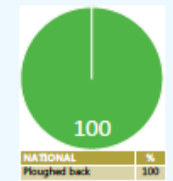
INSECTS, PATHOGENS & WEEDS

INSECT PESTS / INSECTICIDES	DISEASES / PATHOGENS
EARLY-SEASON <i>Helicoverpa punctigera</i> <i>Helicoverpa armigera</i> <i>Craonitades dilutus</i> <i>Trioxys inagahis</i> <i>Aphis gossypii</i>	DISEASES / PATHOGENS <i>Black root rot</i> <i>Pythium & Rhizoctonia spp.</i> <i>Fusarium wilt</i> <i>Heterosporium wilt</i>
MID-SEASON <i>H. armigera / punctigera</i> <i>Craonitades dilutus</i> <i>Aphis gossypii</i> <i>Tetranychus urticae</i> <i>Bemisia tabaci</i>	CHEMICAL CONTROL Azoxystrobin + Metalaxyl + Dynasty Dynasty + Bion Dynasty + Cruiser
INSECTICIDES Clothianidin Dimethoate (Rogor) Fipronil (Regent) Indoxacarb (Steward) Paraffinic oil (Canopy) Pyriproxyfen (Admiral) Diaferthiuron (Pegasus) Emamectin benzoate (Affirm) Abamectin (Abamectin) Deltamethrin (Pyrethroids)	WEEDS / HERBICIDES NARROW-LEAF WEEDS <i>Echinochloa colona</i> <i>Liriodendron panicoides</i> <i>Chloris virgata</i> <i>Chloris truncata</i> <i>Cyperus spp.</i> BROAD-LEAF WEEDS <i>Coryza spp.</i> <i>Sonchus oleraceus</i> <i>Hibiscus trionum</i> <i>Ipomoea spp.</i> HERBICIDES Roundup, Diuron & Pendimethalin Fluom. + Prometryn

WATER

IRRIGATION WATER	IRRIGATED AREA %
2,655	10 90
ML/HA/UNIT	PLANTED IRRIGATED
NATIONAL	NATIONAL
IRRIGATION METHODS %	
1 91 6 2	
FLOOD FURROW SPRINKLER DWP	NATIONAL

STALK USE %



COMPETING CROPS

Wheat, Sorghum
Corn, Chickpea

ROTATION CROPS

Wheat
Sorghum

FERTILIZERS

	Nitrogen	Phosphorus P ₂ O ₅	Potash K ₂ O	NPK
'000 Tonnes	80.0	20.6	10.2	110.9
Kg/Ha	421.3	108.4	53.9	583.6
g/Kg Lint	151.6	39.0	19.4	210.0

COUNTRY DATA: RESEARCH, WEATHER, PRODUCTION COSTS

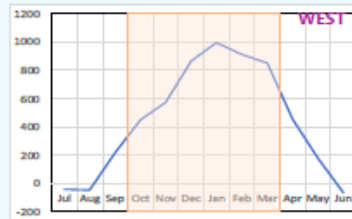
STRUCTURE OF COTTON RESEARCH

Cotton Research and Development Corporation, Narrabri, NSW plays an important role in cotton research. The Australian cotton research system is a network of professional disciplines, public institutions, non-profit organisations and private companies bound by legislation and commercial relationships. The agencies involved in the cotton research system include the Cotton Research and Development Corporation (CRDC), Cotton Australia, Cotton Seed Distributors, CSIRO, the Australian Government's Department of Agriculture and Water Resources,

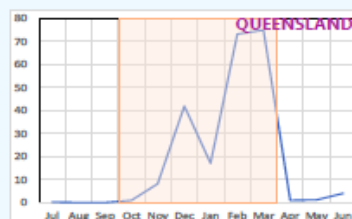
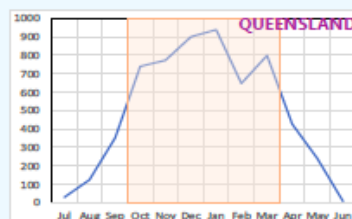
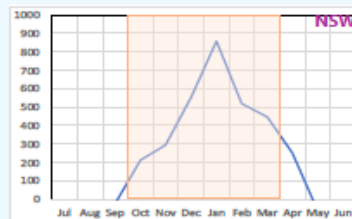
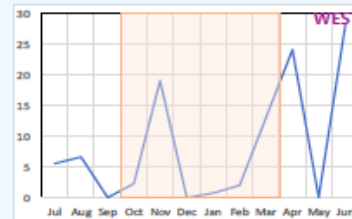
the Queensland Government's Department of Agriculture and Fisheries, the NSW Department of Primary Industries and universities (including Australian National University, Deakin University, Griffith University, Macquarie University, University of Southern Queensland, Queensland University of Technology, University of Melbourne, University of New England, University of New South Wales, University of Queensland, University of Southern Queensland, University of Sydney, University of Technology, Sydney and the University of Western Sydney).

WEATHER 2018-19

Monthly DD60 Heat units



Monthly Rainfall (mm)



COST OF CULTIVATION (US\$) PER HECTARE

OVERHEAD IRRIGATED

INPUTS	Quantity used (Kg/Ha)	Number per season	Total cost per hectare
Non-GM seeds			
Biotech/GM seeds	13		344.4268
NPK+Other	366		350.982
Insecticides	1.105 L+0.12 Kg		93.0308
Herbicides	4.6 kg+ 9.05 L		80.75
Fungicides / antibiotics etc.,			
Growth regulators			
Defoliant	7.13 L		80.0156
Manure			15.5244
MANPOWER / LABOUR	Persons per operation (No.)		
Land preparation /tillage etc.,			
Sowing			
Fertiliser / manure application			
Irrigation			
Thinning			
Weeding			
Hoeing			
Pesticide application			
Defoliator application			
Picking / harvesting			
Stalk cutting & removal			
Transportation /unloading etc.,			115.2
INFRASTRUCTURE	Cost per operation (US\$)		
Tractors	5.81	21	122.06
Implements & tools			
Electric / Diesel pumps etc.,			598.4
Electricity / Diesel etc.,			
Harvesting machines	198.24	1	134.8032
Hoeing / Tillage machinery etc.,	11.5	1	7.82
Bullocks /Buffaloes			
Consultant			43.52
Levies + Insurance			199.24
Ginning cost (US\$) per 100 Kg	19.47		530.4
MARKET VALUE	US\$ per 100 Kg	Yield Kg/per hectare	Value per hectare (US\$)
Seed cotton	68.00	6810	4630.8
Lint (fibre)	178.84	2724	4871.52
Seed	40.80	4000	1632
Cotton seed-oil			
Seed-cake			
Cost of Cultivation			2185.77
Net Returns (seed-cotton)			2445.03
Net Returns (lint+seed)			3787.35

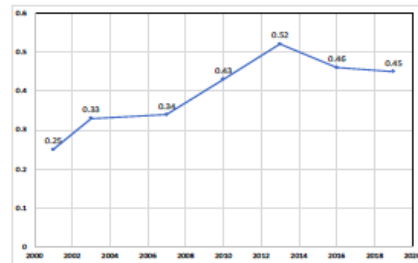
LONG TERM TRENDS, INTER-COUNTRY COMPARISONS

LONG TERM TRENDS

Long term comparison of costs has been done without adjusting for inflation.

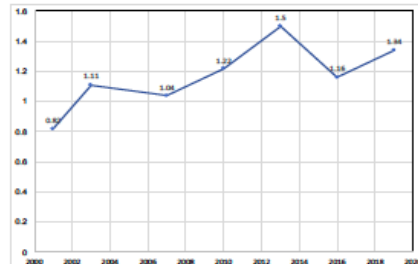
SEED-COTTON PRODUCTION COST: The cost of seed-cotton production increased from 25 cents per Kg in 2001 to 52 cents in 2013 and declined later to 45 cents in 2019 (Figure 1).

Figure 1. Production cost (US\$) per Kg seed-cotton



LINT PRODUCTION COST: The production cost of lint followed a similar trend to that of seed-cotton with an increase from 82 cents per Kg in 2001 to 150 cents in 2013 and declined later to 134 cents in 2019 (Figure 2).

Figure 2. Production cost (US\$) per Kg Lint



WEEDING COSTS: Weeding costs per Kg lint increased from 9 cents per Kg in 2001 to 31 cents in 2013 and declined later to 13 cents in 2019 (Figure 3).

FERTILIZER COSTS: Fertilizer costs per Kg lint increased almost consistently over the years from 13 cents per Kg in 2001 to 31 cents in 2019 (Figure 4).

Figure 3. Weeding cost (US\$) per Kg Lint

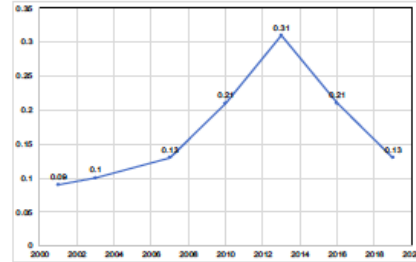


Figure 4. Fertilizer cost (US\$) per Kg Lint

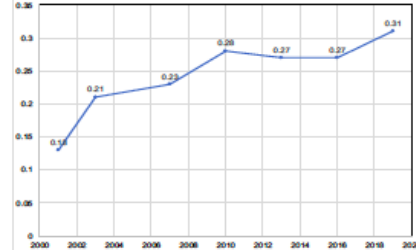
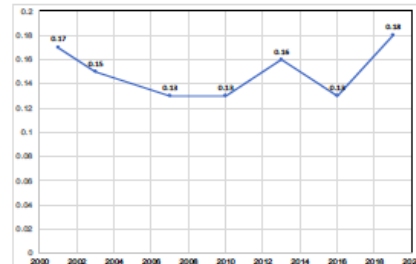


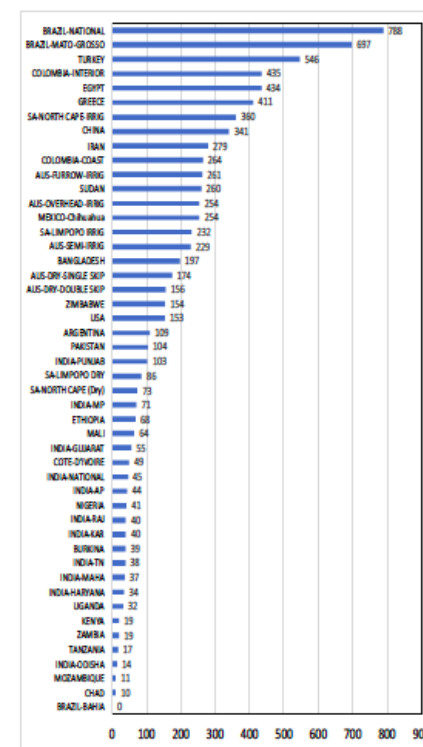
Figure 5. Insecticide cost (US\$) per Kg Lint



INSECTICIDE COSTS: Insecticide costs per Kg lint decreased from 17 cents per Kg in 2001 to 16 cents in 2013 and increased further to 18 cents in 2019 (Figure 5).

GINNING COST: Interestingly ginning costs seem to fluctuate within a range of 16 to 20 cents during 2001 to 2016 but declined to 14 cents per Kg lint in 2019 (Figure 6).

Figure 9. Pesticide Cost (US\$) per Hectare



MACHINERY COST: The global average cost of machinery use is US\$ 235 per hectare. The cost is highest at US\$ 504 to 917 in South Africa, Australia and Mexico. Machinery use cost is also high at US\$ 300 to 450 in Colombia, Turkey, Iran and China. Machinery cost is lowest in African countries where mechanization hasn't as yet taken place in majority of the countries.

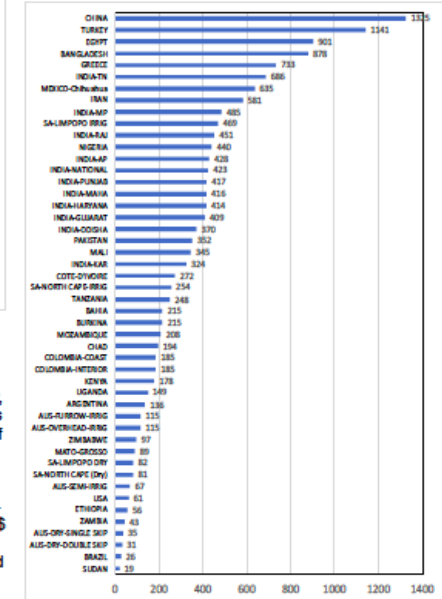
GINNING COST: The global average ginning cost is US\$ 141 per hectare of cotton harvested. Ginning costs are highest at US\$ 530 to 610 in Australia and South Africa, and US\$ 207 to 352 in Brazil, Colombia and semi-irrigated regions of Australia. The cost of ginning per hectare is low in Africa and India because of low yields.

CULTIVATION COST: The global average cost of cultivation per hectare is US\$ 1364 per hectare. Cultivation costs are high at US\$ 2000 to 3500 in Mexico, Brazil, South Africa, Australia and China. The costs range from US\$ 1000 to 2000 in Colombia, Iran, parts of Brazil and India (Tamilnadu). Cultivation costs are lowest at US\$ 100 to 572 in majority of the African countries (Figure 11).

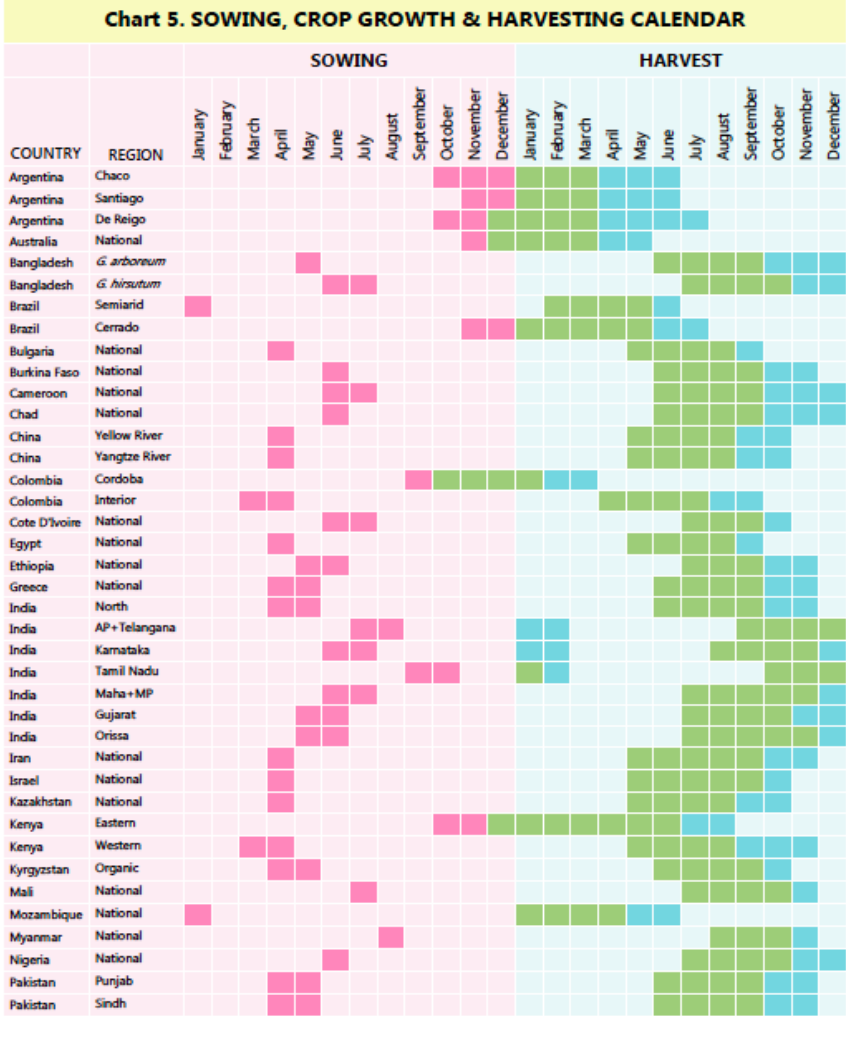
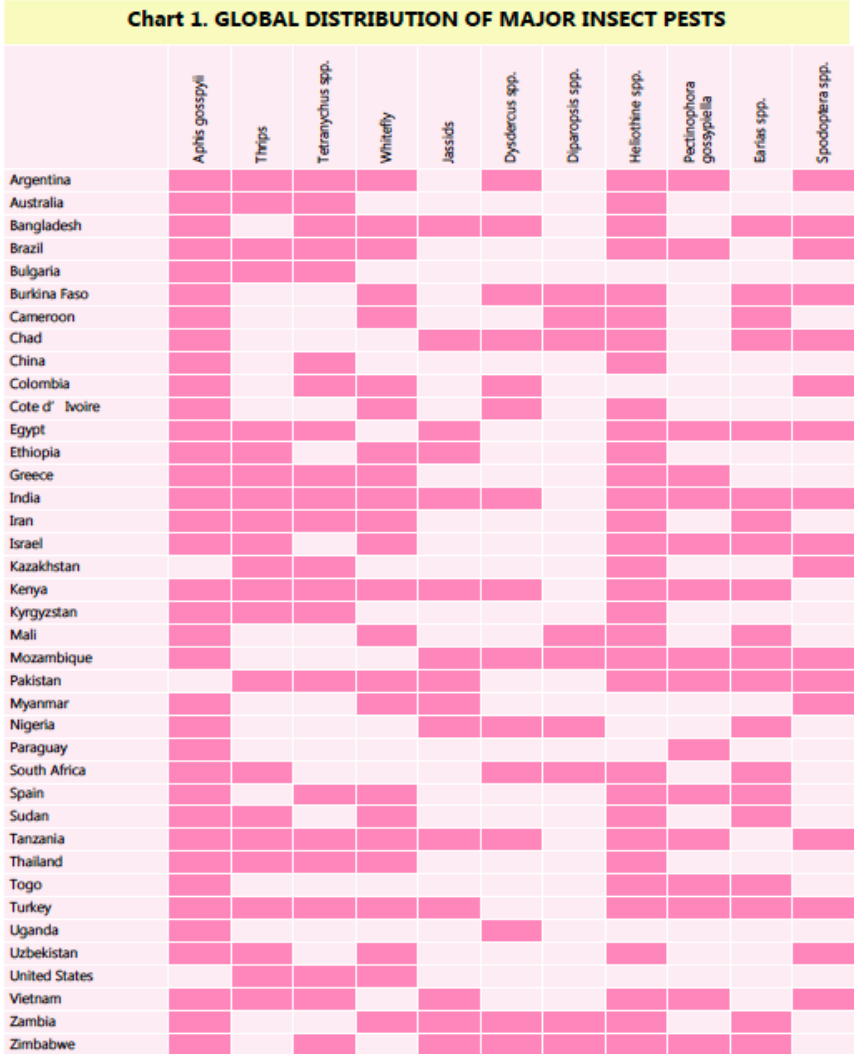
PRODUCTION COST: The global average production cost is US\$ 0.45 per Kg seed-cotton and US\$ 1.34 per Kg lint. Production cost of seed-cotton (Figure 12) is highest at US\$ 0.5 to 0.75 in Mexico, Brazil, Zimbabwe, Mali, India, Greece, Iran, Egypt, Turkey, Nigeria and China. Production cost is lowest at US\$ 0.13 to 0.32 per Kg seed-cotton in Zambia, Ethiopia, USA, Tanzania, Argentina, Uganda, Australia (Furrow-irrigated) and Pakistan.

Production cost of lint (Figure 13) is highest at US\$ 1.49 to 2.09 per Kg lint in Kenya, Bangladesh, USA, Turkey, Nigeria, Mali, India, Greece, Egypt, Iran and China and lowest at less than US\$ 1.0 per Kg lint in Zambia, Ethiopia, Uganda, Tanzania, Mozambique, Cote D'ivoire and Australia (Furrow irrigated).

Figure 10. Manpower Cost (US\$) per Hectare



CHARTS: PESTS, WEEDS etc., SOWING & HARVESTING CALENDAR



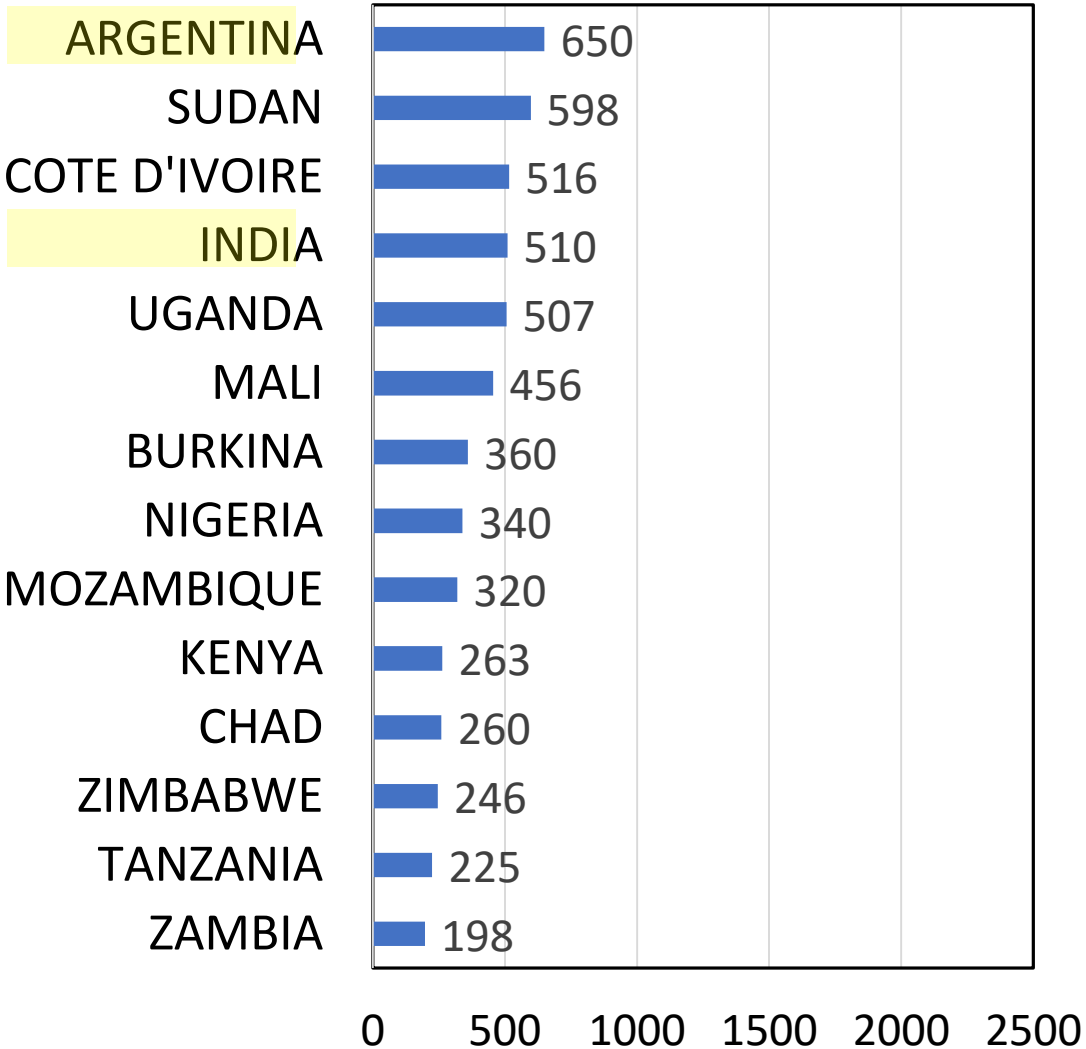
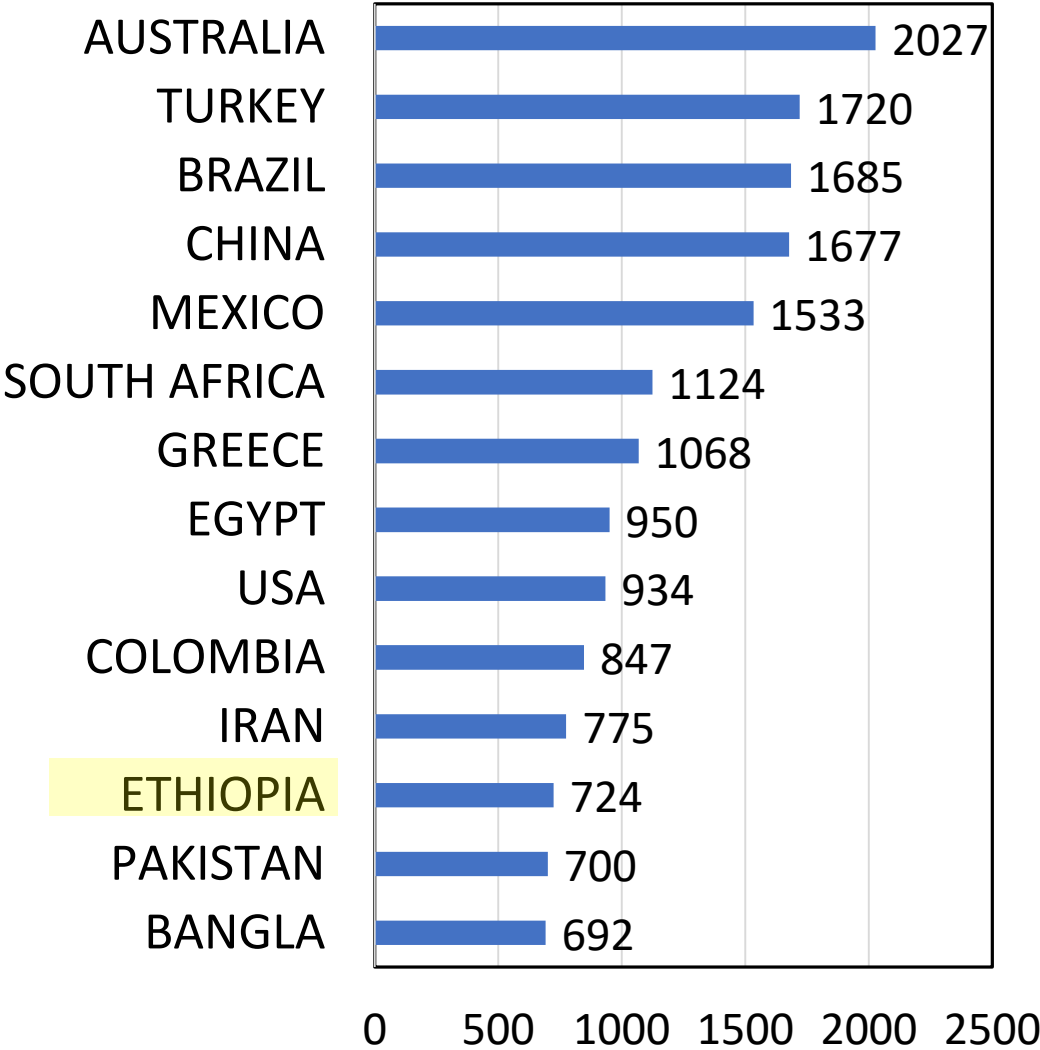
Net return per hectare

Yields

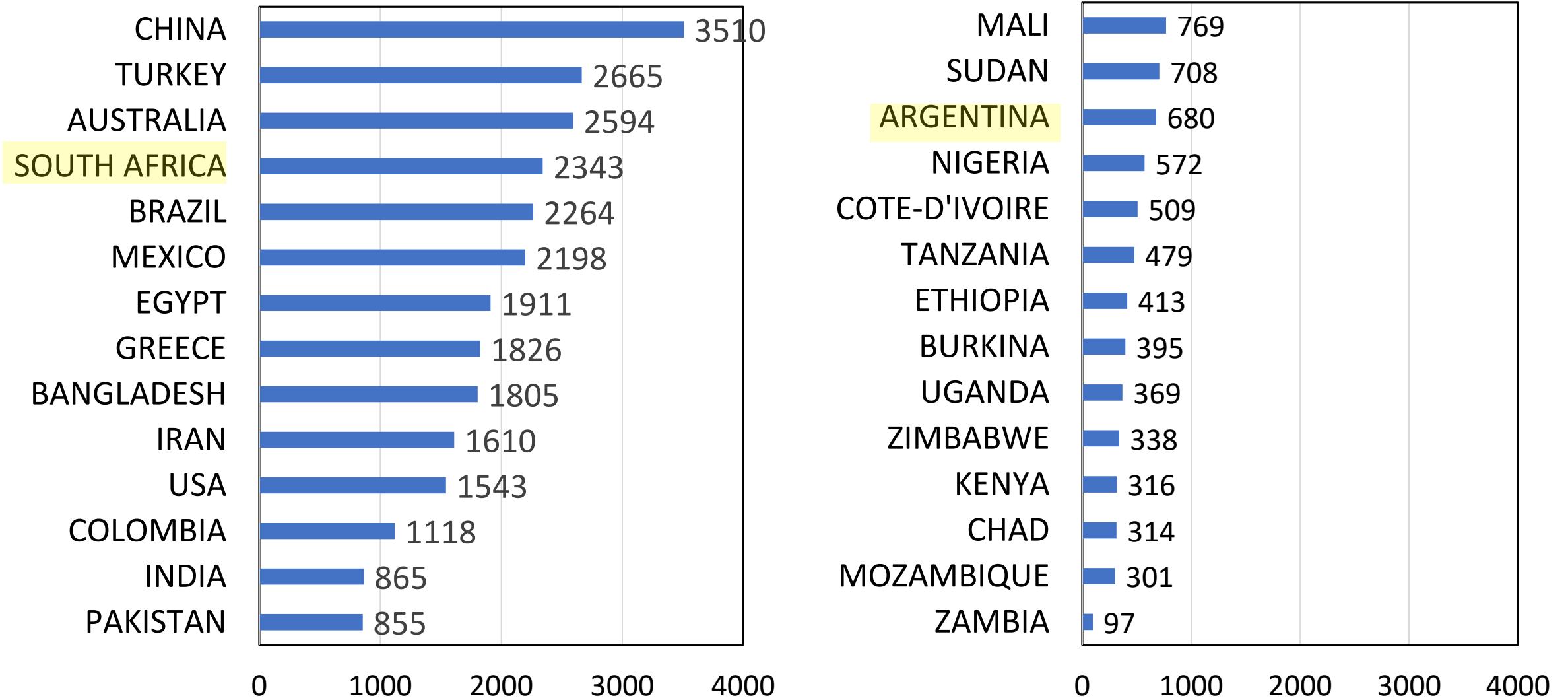
Market price

Production costs

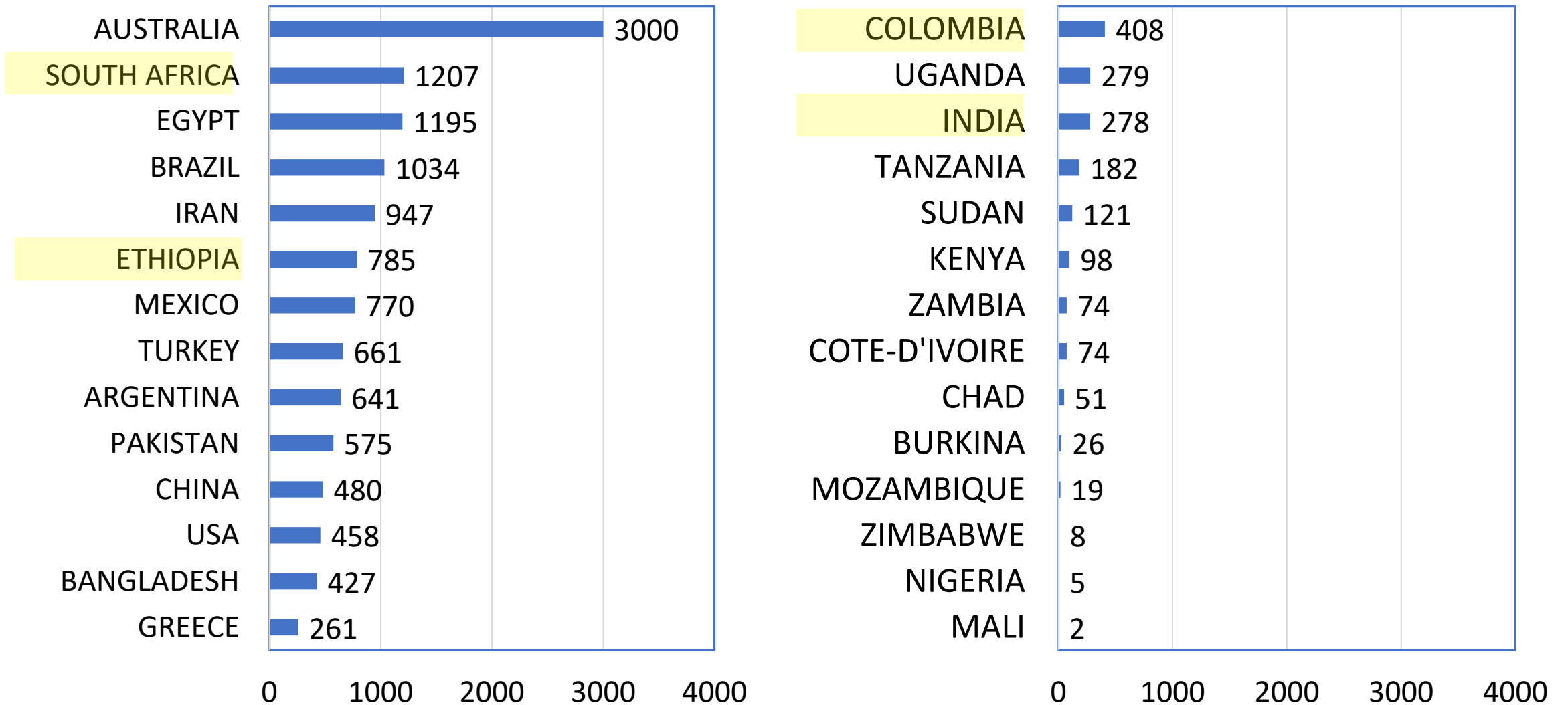
Lint Yield (Kg/Ha)



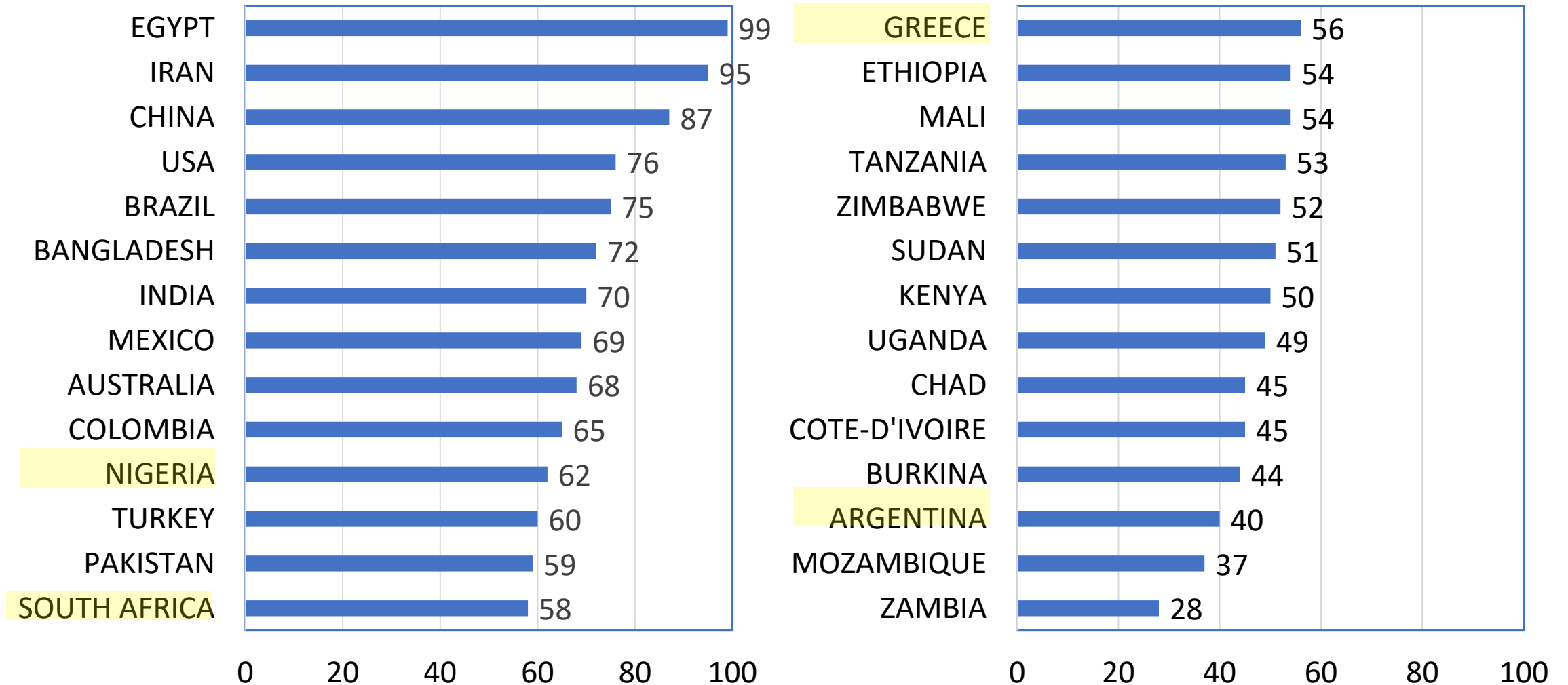
Cost of Cultivation (US\$) per Hectare



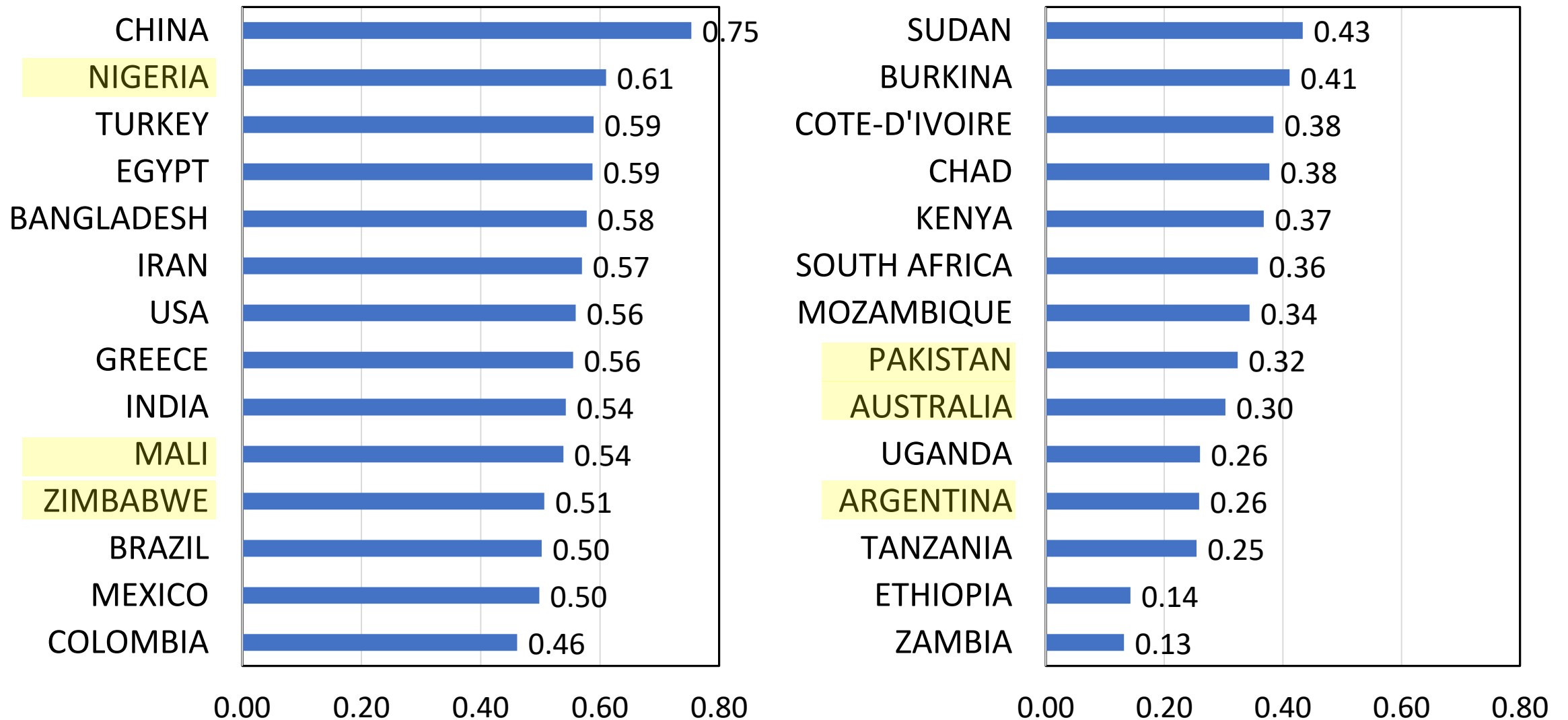
Net Returns on Seed-Cotton (US\$) per Hectare



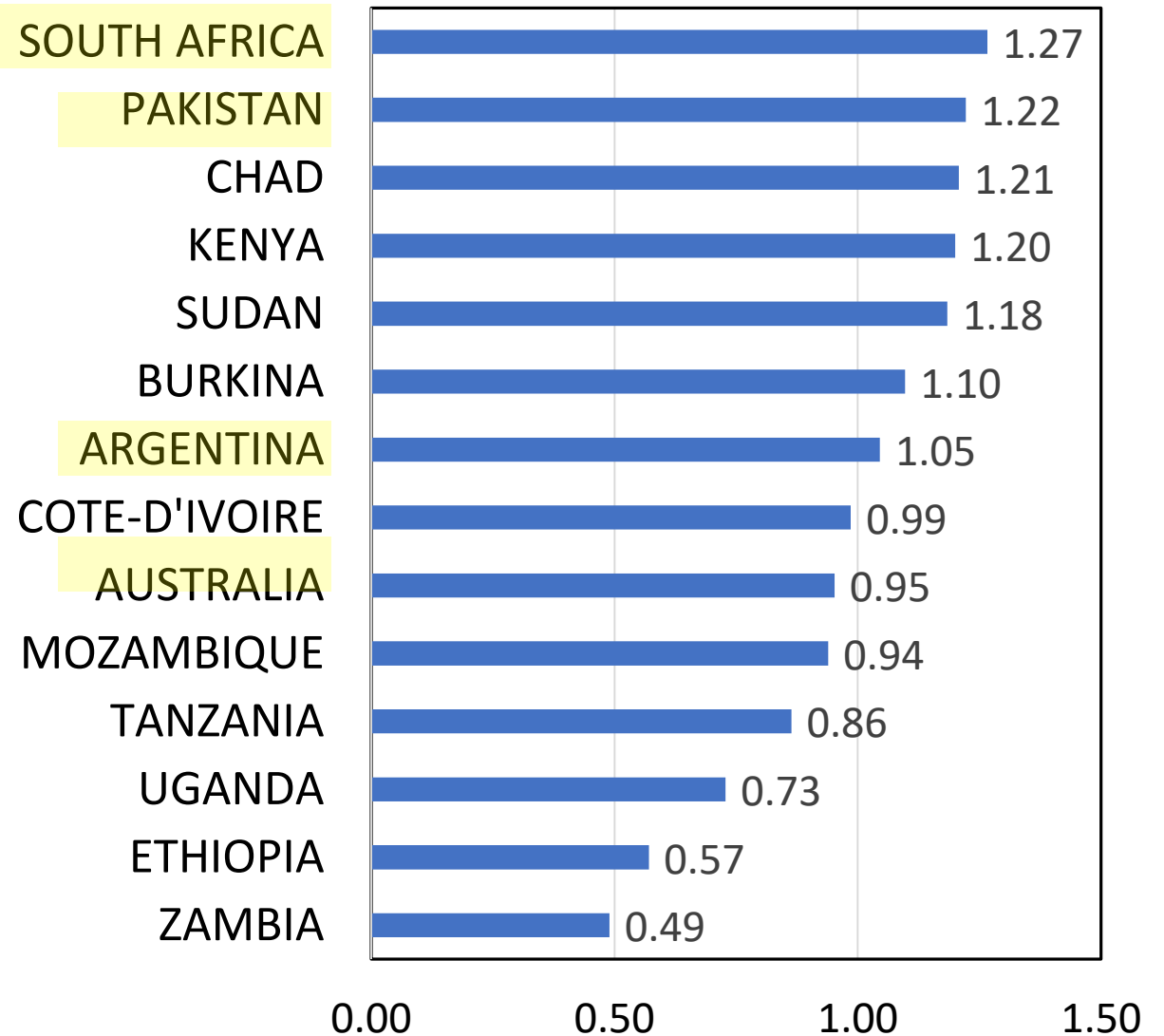
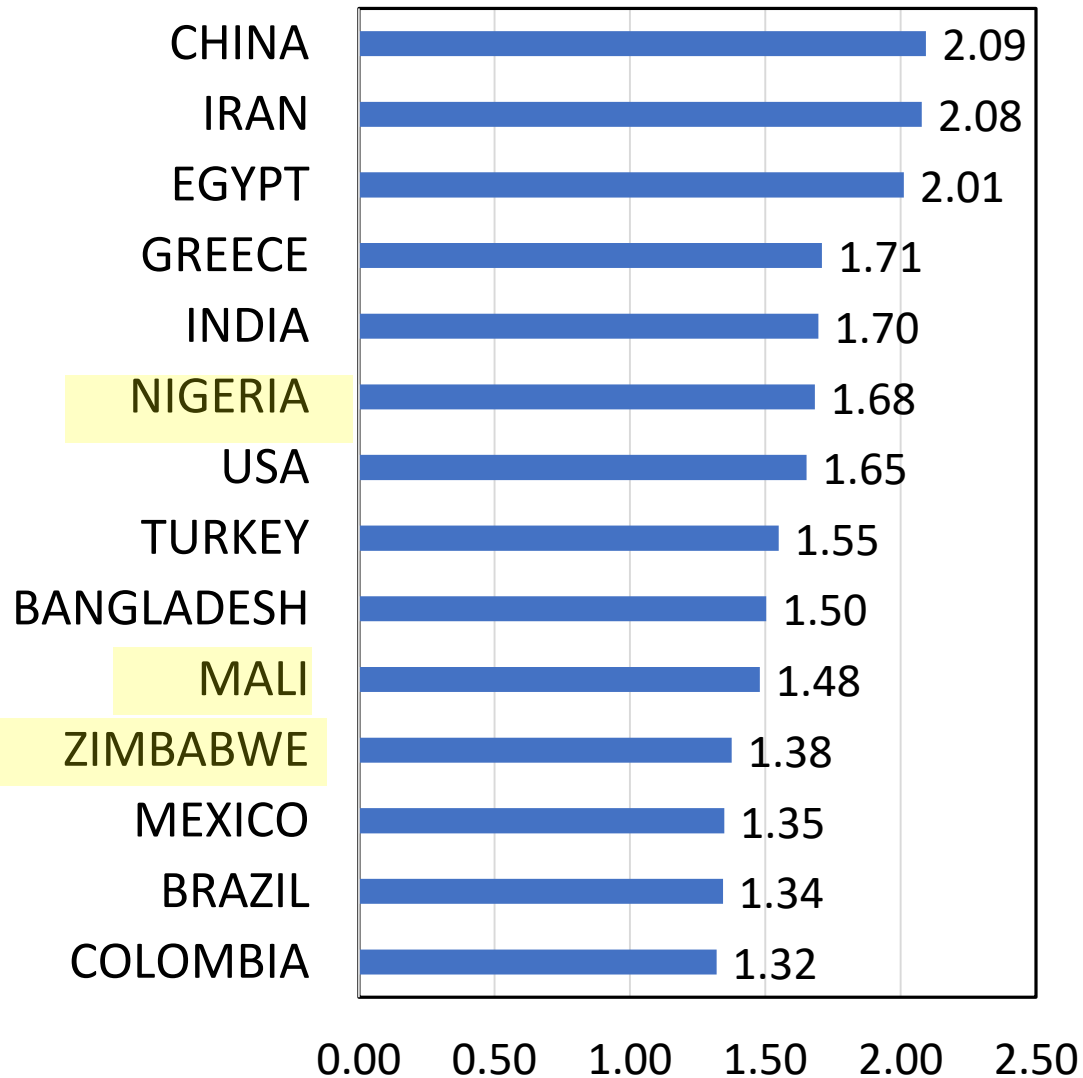
Market Price of Seed-Cotton (US\$) 100 Kg



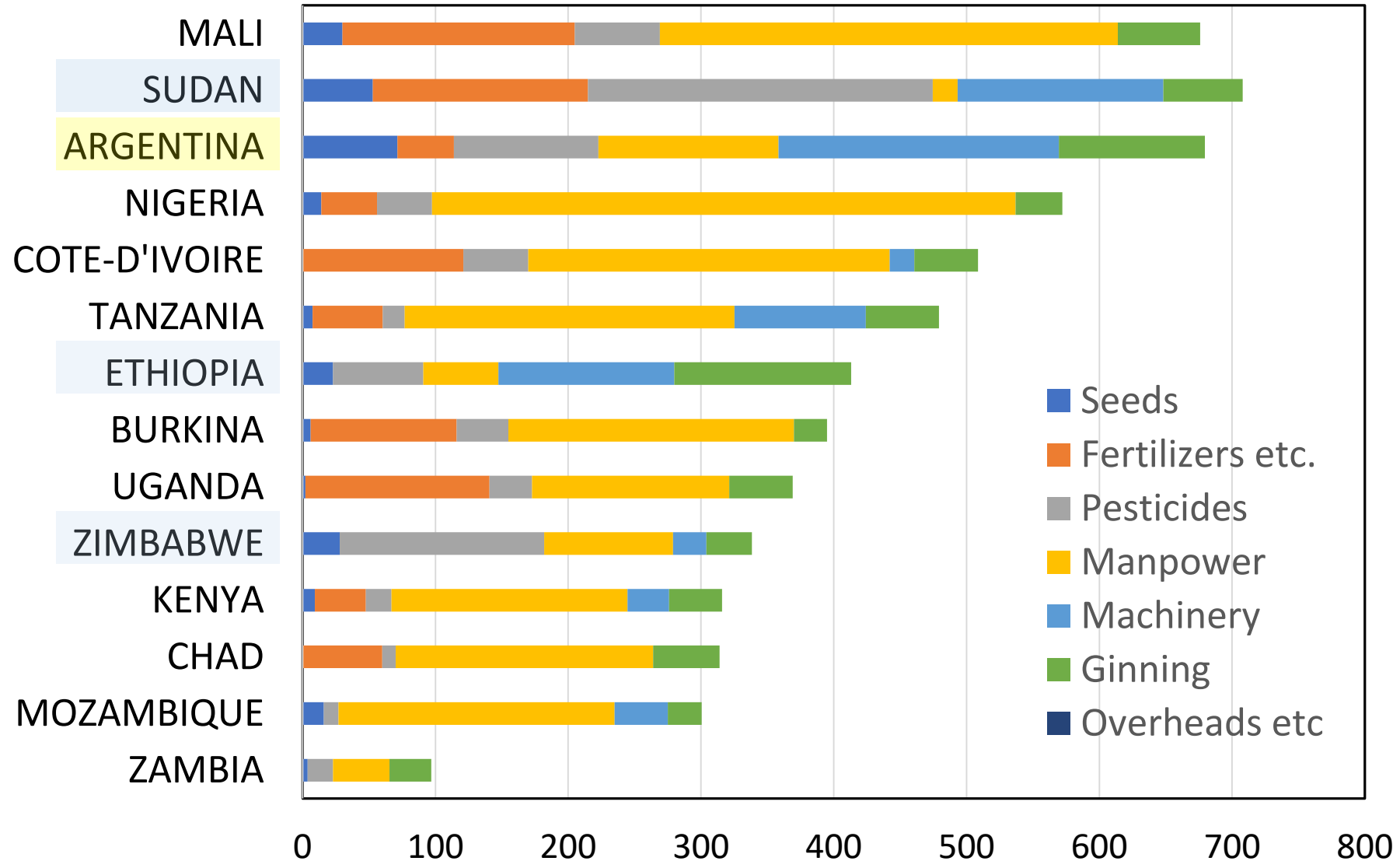
Production Cost (US\$) of 1 Kg seed-cotton



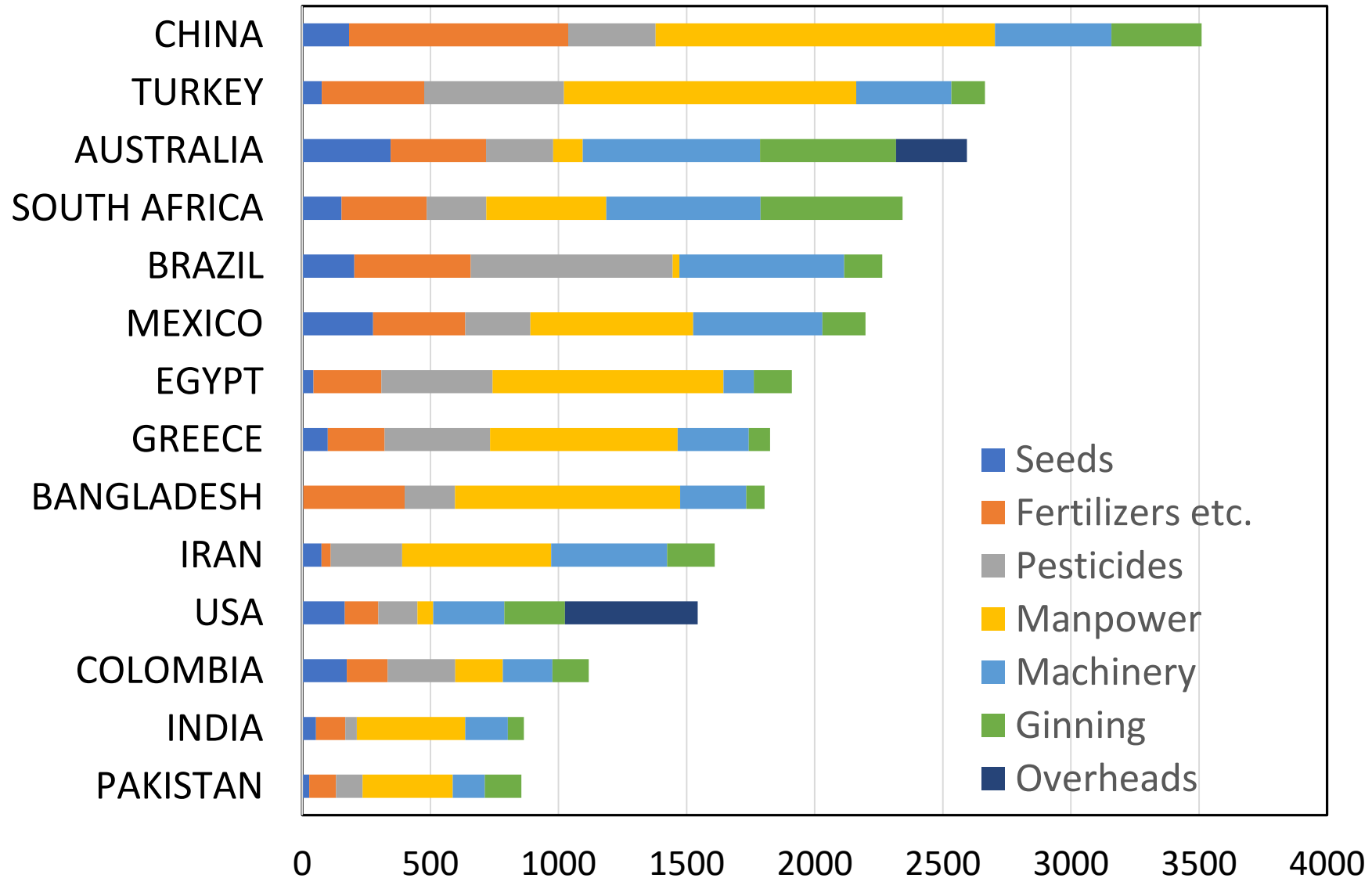
Production Cost (US\$) of 1 Kg Lint



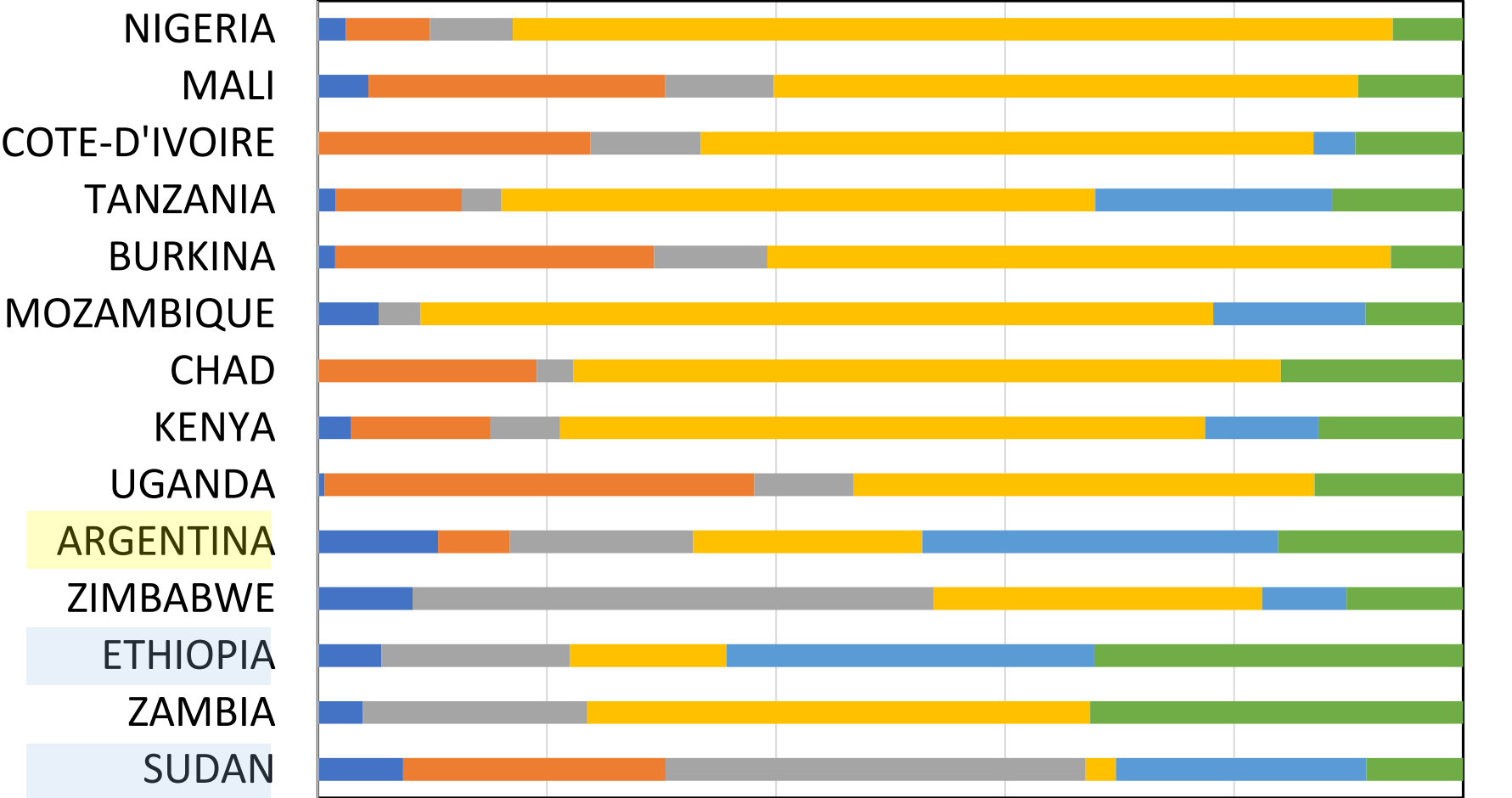
Input Costs (US\$) per Hectare in 'Low-Yield Countries'



Input Costs (US\$) per Hectare in 'High Yield countries'

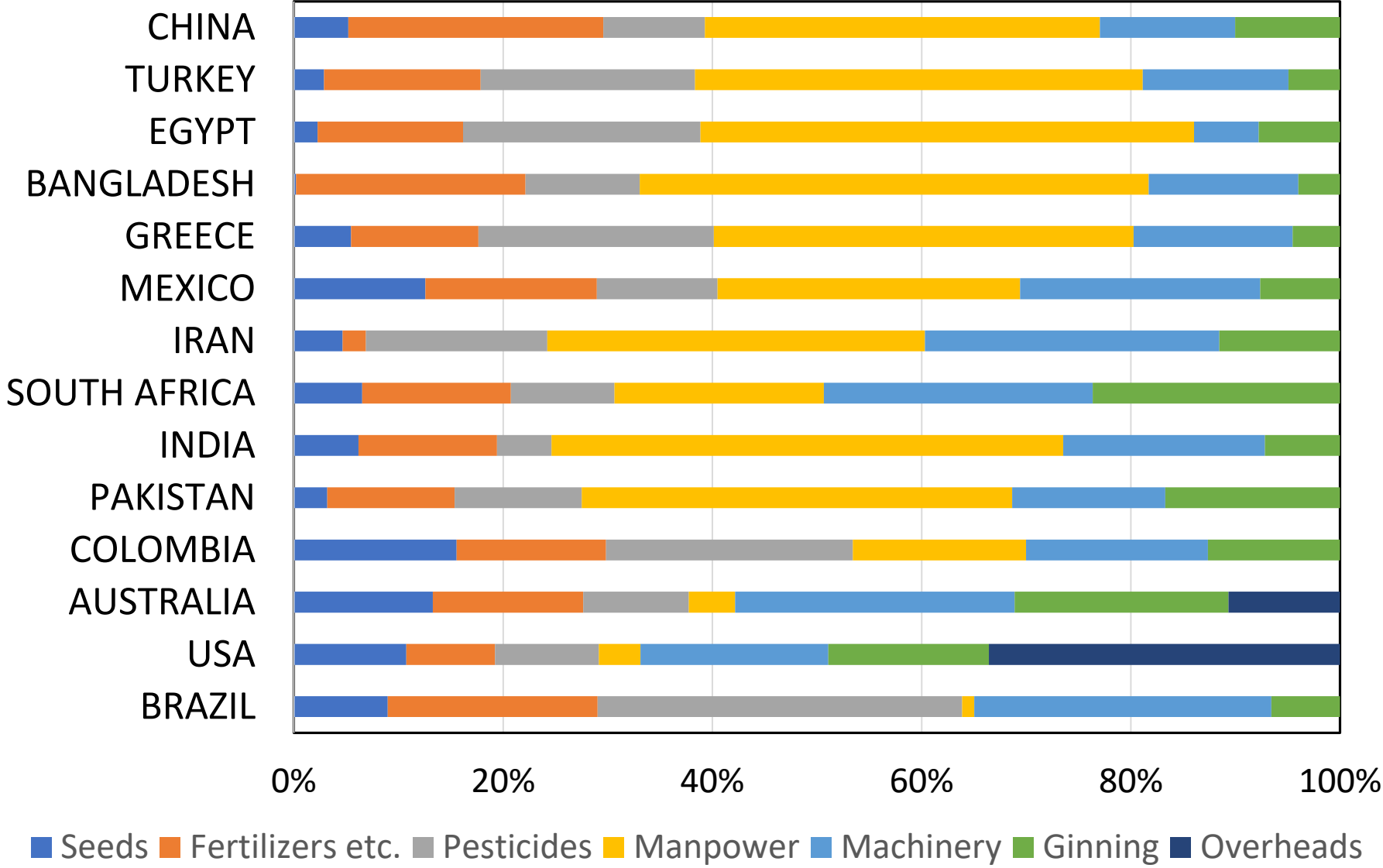


Proportion of Input Costs in 'Low Yield Countries'

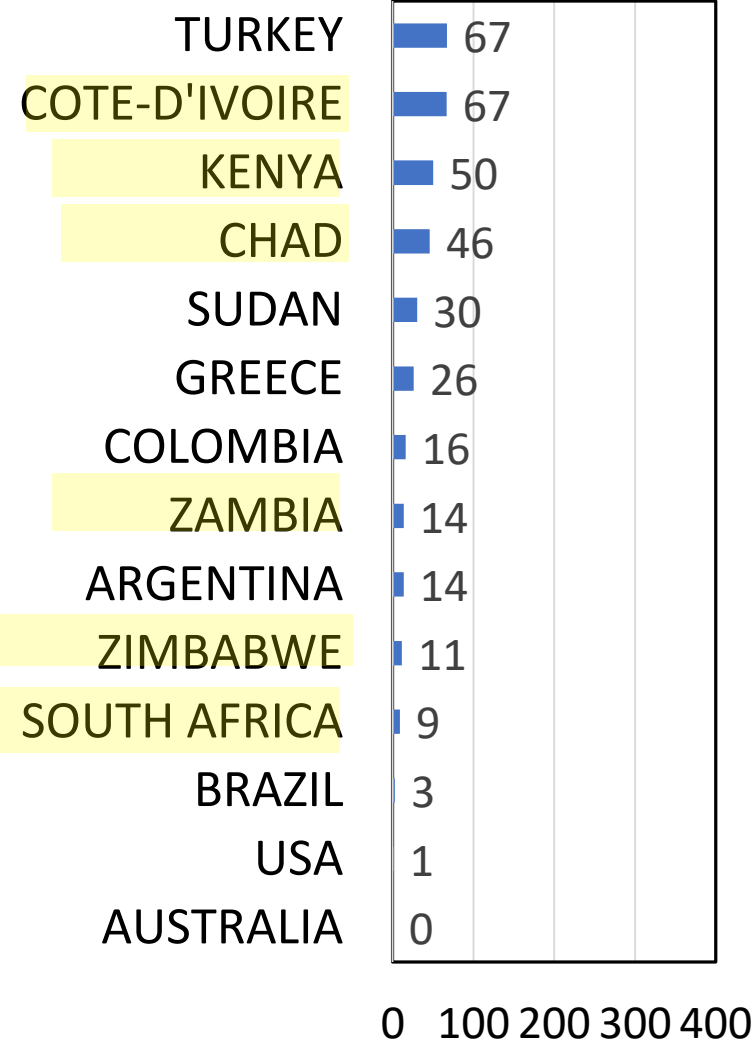
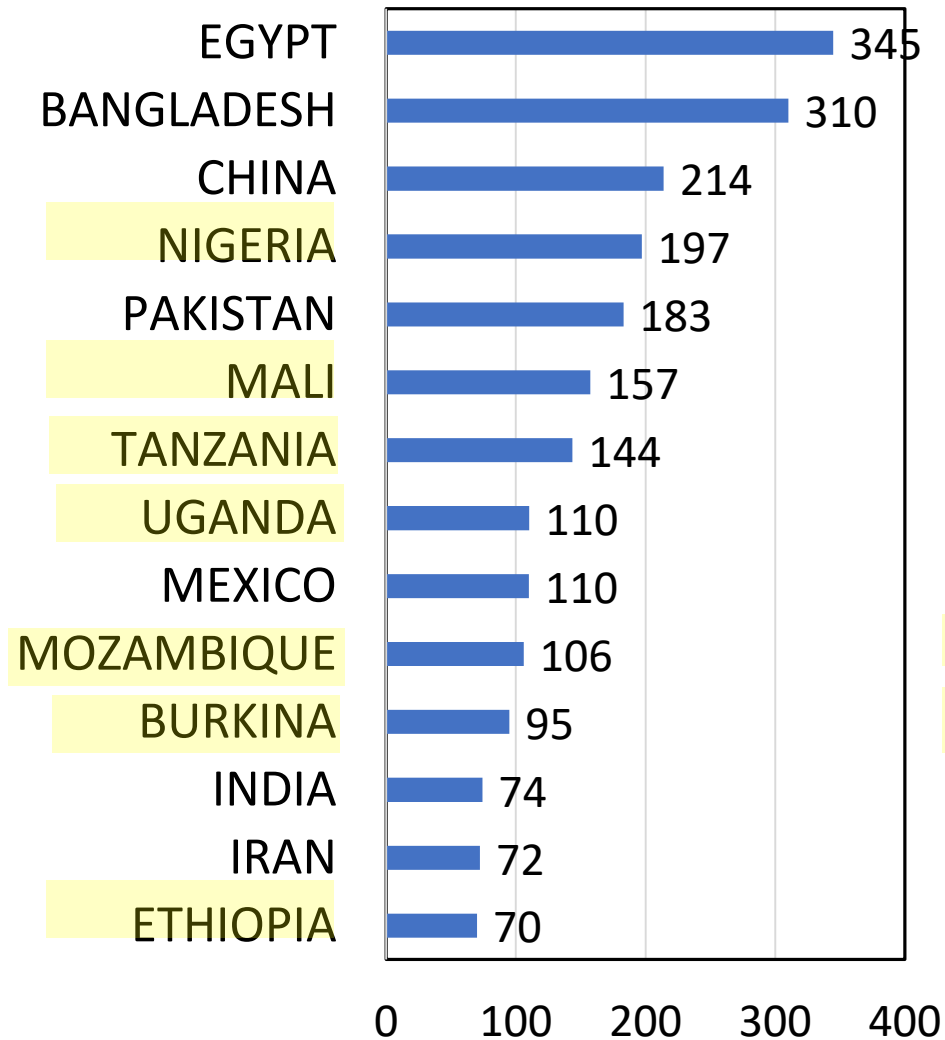


■ Seeds ■ Fertilizers etc. ■ Pesticides ■ Manpower ■ Machinery ■ Ginning

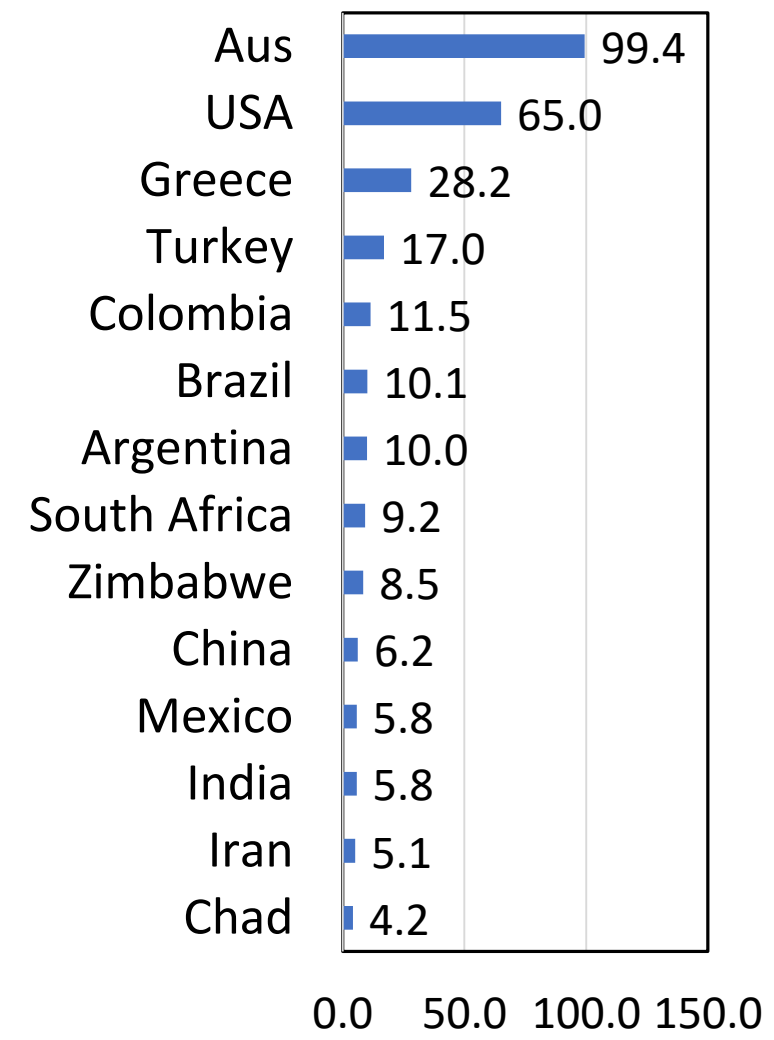
Proportion of Input Costs in 'High Yield Countries'



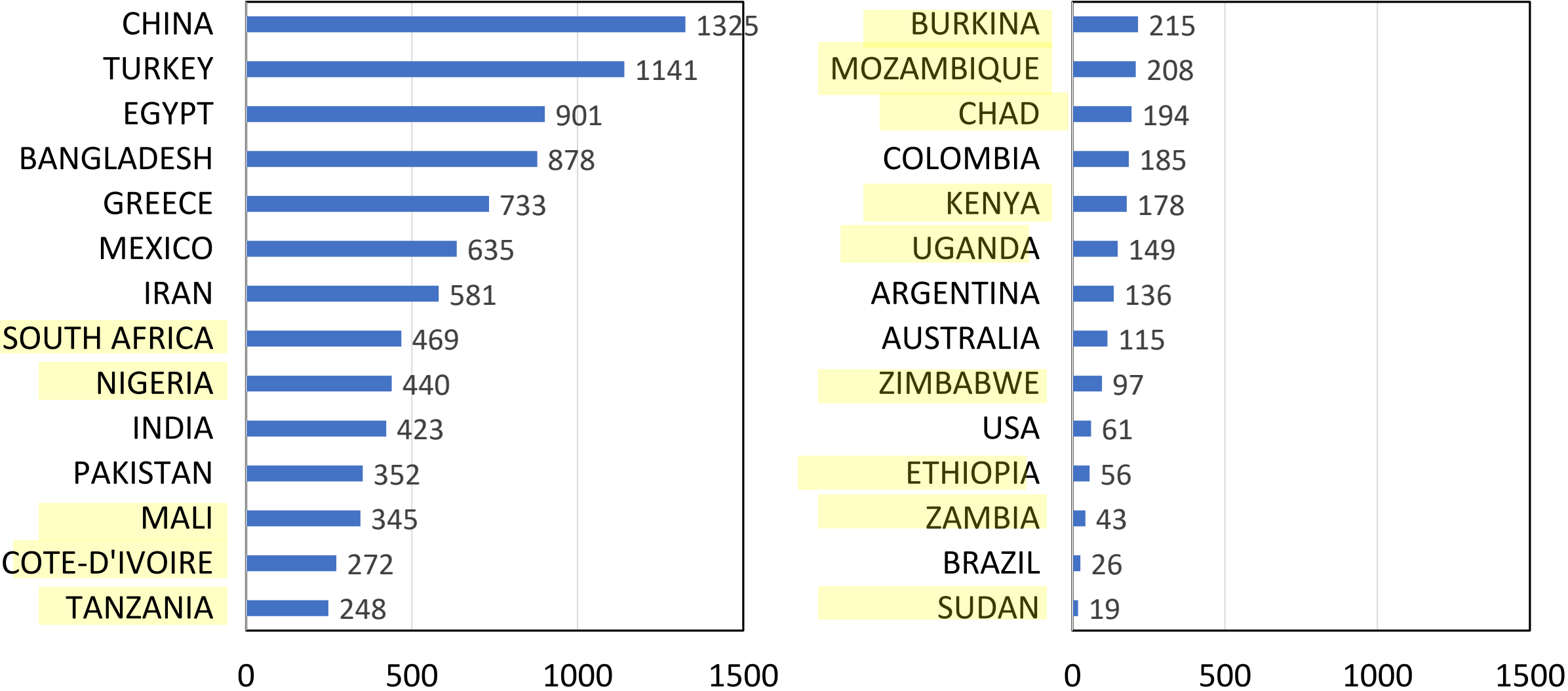
Man Days per Hectare



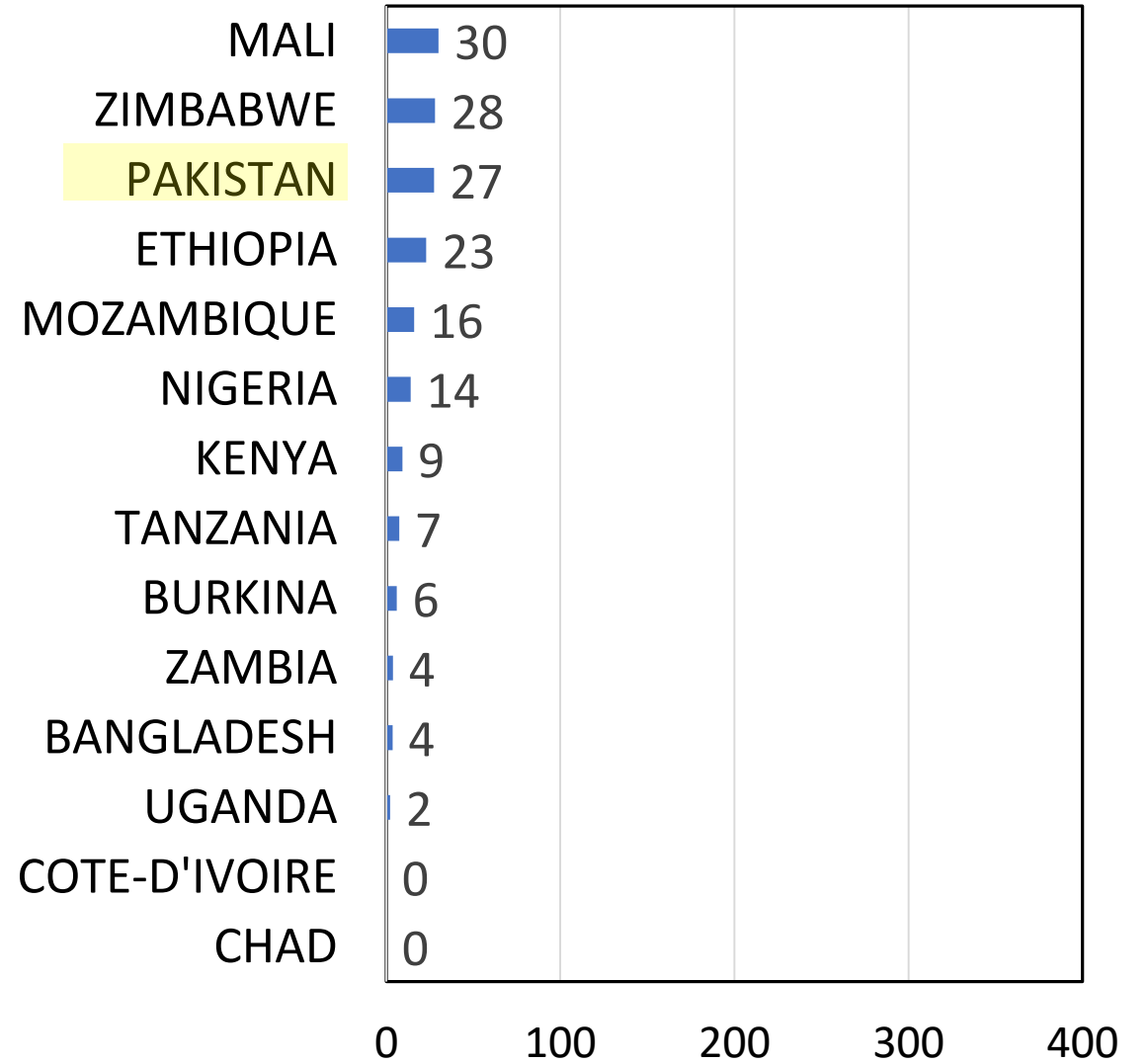
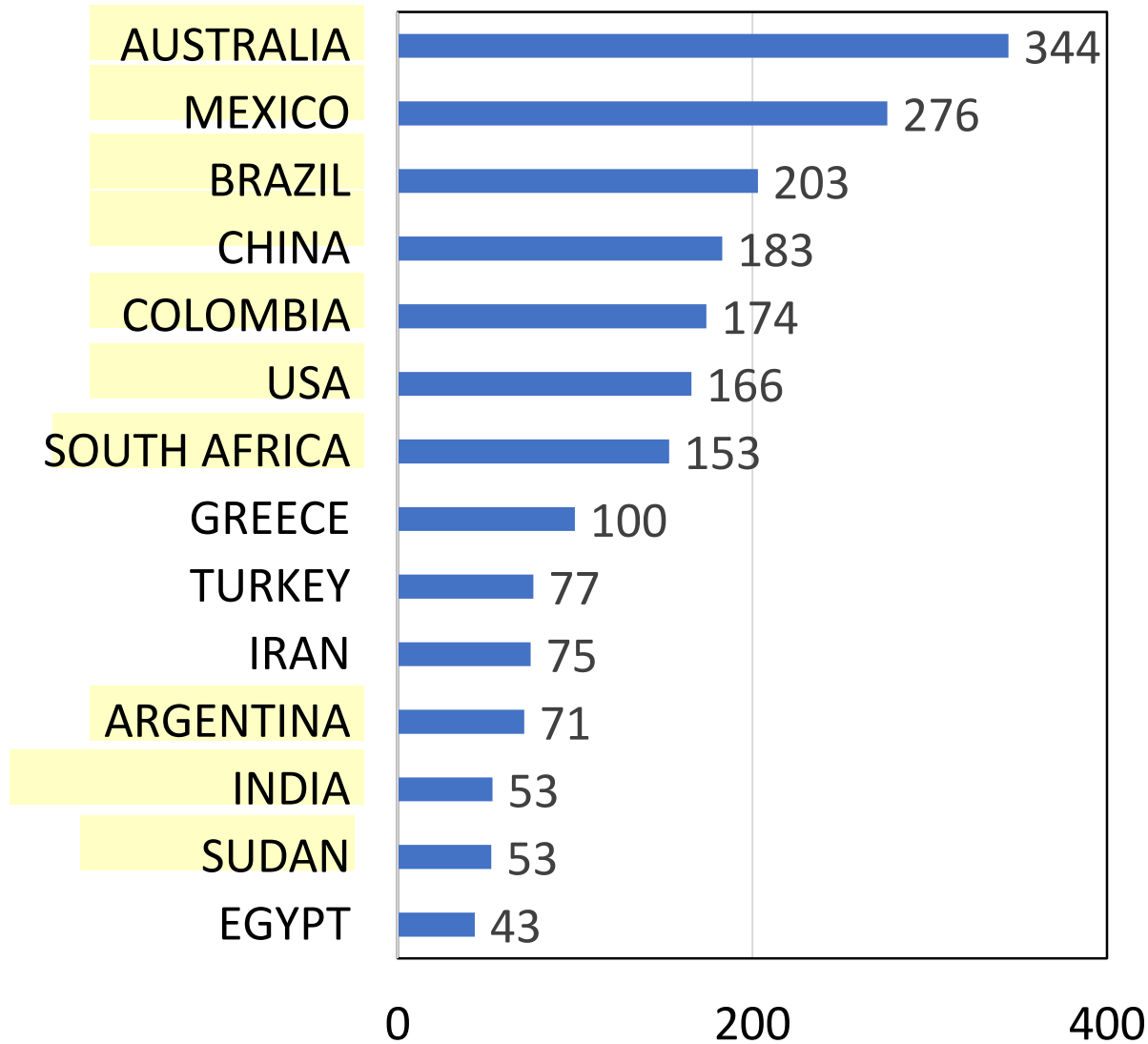
Daily wages (US\$)



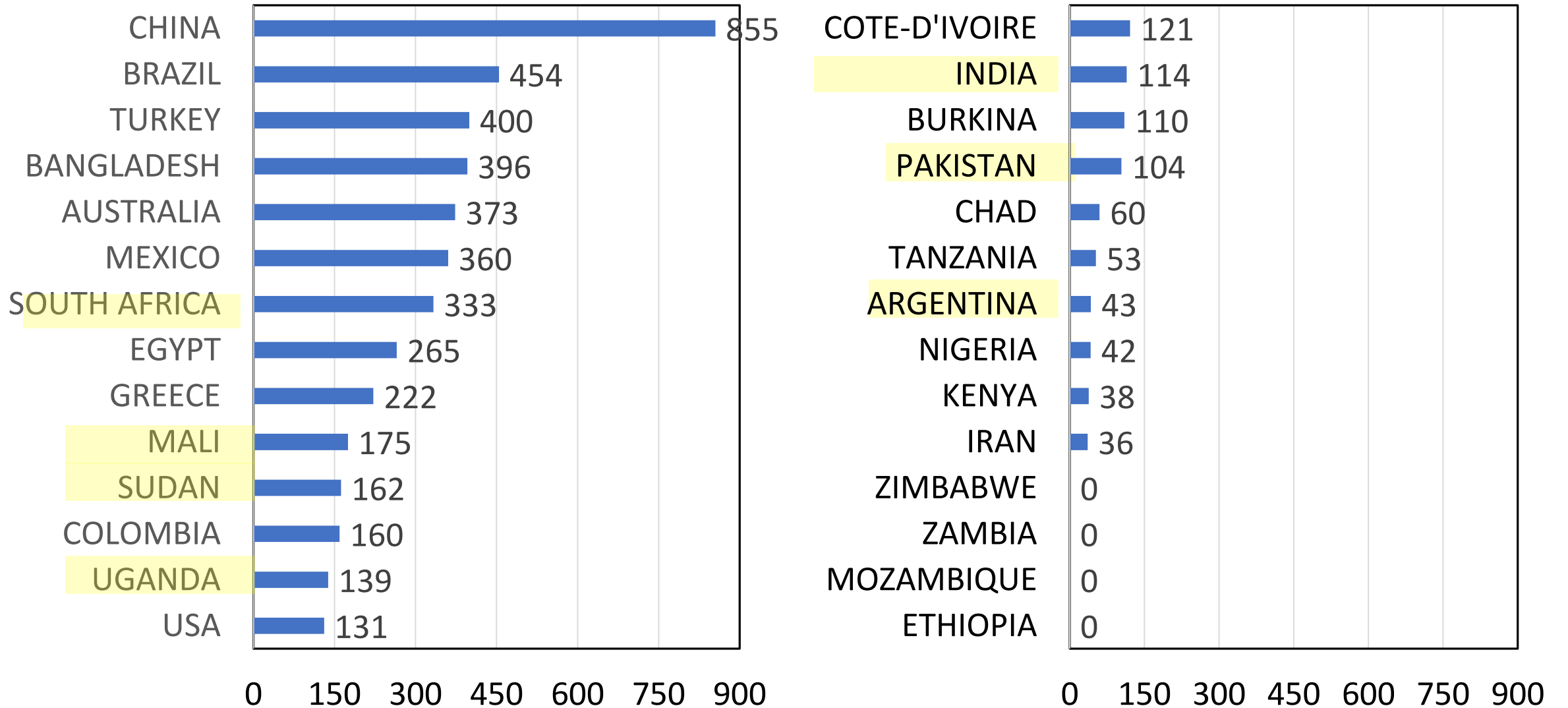
Manpower Cost (US\$)/Ha



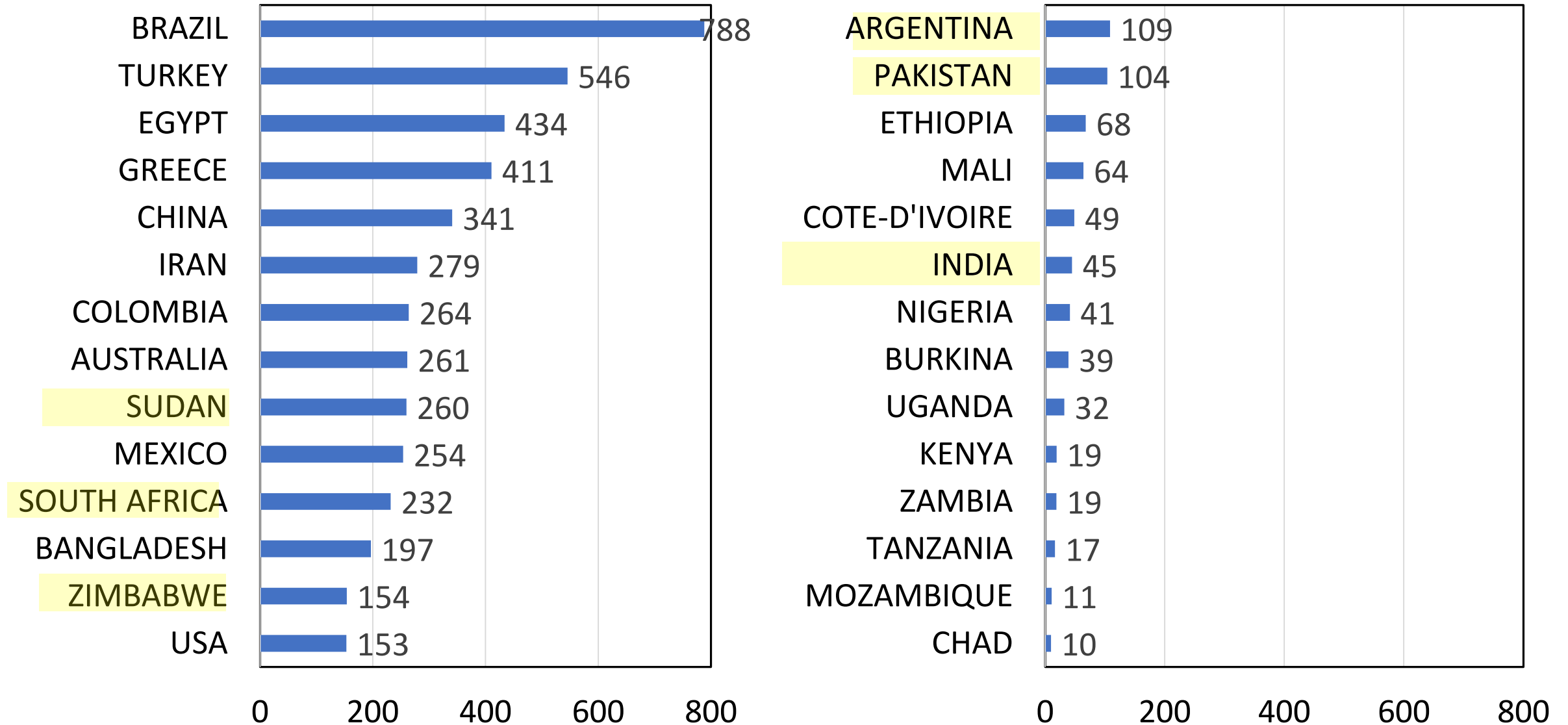
Cost of Seed (US\$)/Ha



Cost of Fertilizers (US\$)/Ha



Cost of Pesticides (US\$)/Ha



RECOMMENDATIONS

- The proportion of manpower costs is high in Africa
- Man-days are high at more than 100 per hectare in Egypt, Bangladesh, China, Nigeria, Pakistan, Mali, Tanzania, Uganda and Mozambique
- **SMALL SCALE MECHANIZATION IS A PRIORITY**
- Yields in Africa, India and Pakistan must improve
- **USE DELINTED SEEDS, INCREASE HARVEST INDEX**
- Seed cotton market price is lowest in Africa
- **FARMERS NEED GOVERNMENT SUPPORT**
- Brazil, Turkey, Egypt, Greece and China need to cut down costs on pesticides
- **PESTICIDE MANAGEMENT AND INSECT RESISTANCE MANAGEMENT**
- Biotech seeds are expensive
- **AFRICA NEEDS TO CONSIDER DILIGENTLY**

Thank You