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Food and
Agriculture
Organization
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Organisation des
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pour
l'alimentation
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Продовольственная и
сельскохозяйственная
организация
Объединенных
Наций

Organización
de las
Naciones Unidas
para la
Alimentación y la
Agricultura

ASIA AND PACIFIC COMMISSION ON AGRICULTURAL STATISTICS

TWENTY-SEVENTH SESSION

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Agenda Item 11

**Price Statistics: Collecting producer prices: rational,
challenges and proposed solutions**

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Outline

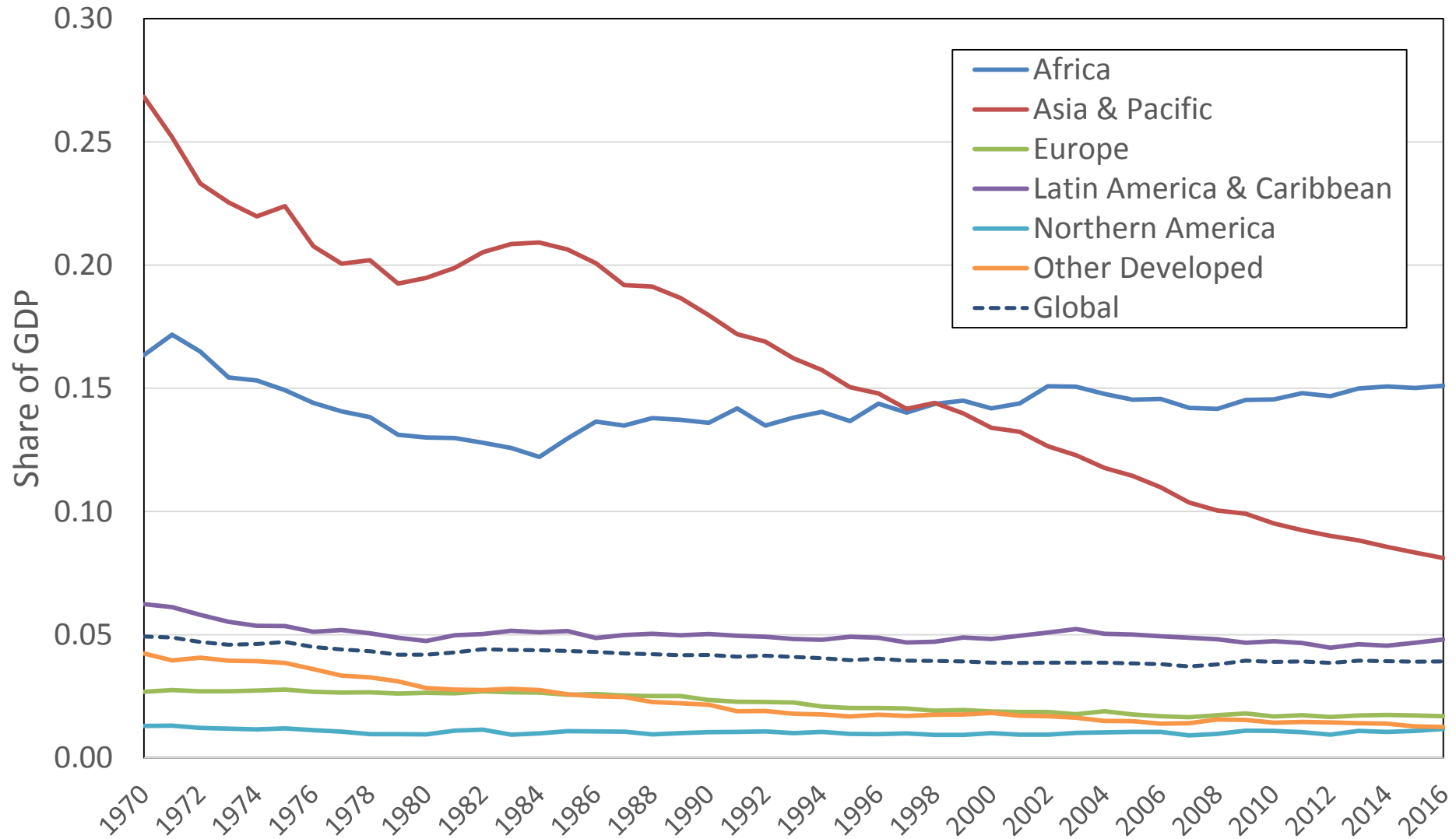
- 1. Agriculture context & users and uses of producer prices**
- 2. Definitions: Producer Prices & Producer Price Indexes**
- 3. Sampling for PPIs: challenges and solutions when small producers are collectively “large”**
- 4. Producer Prices in the value-chain: synergies with market information and market prices**



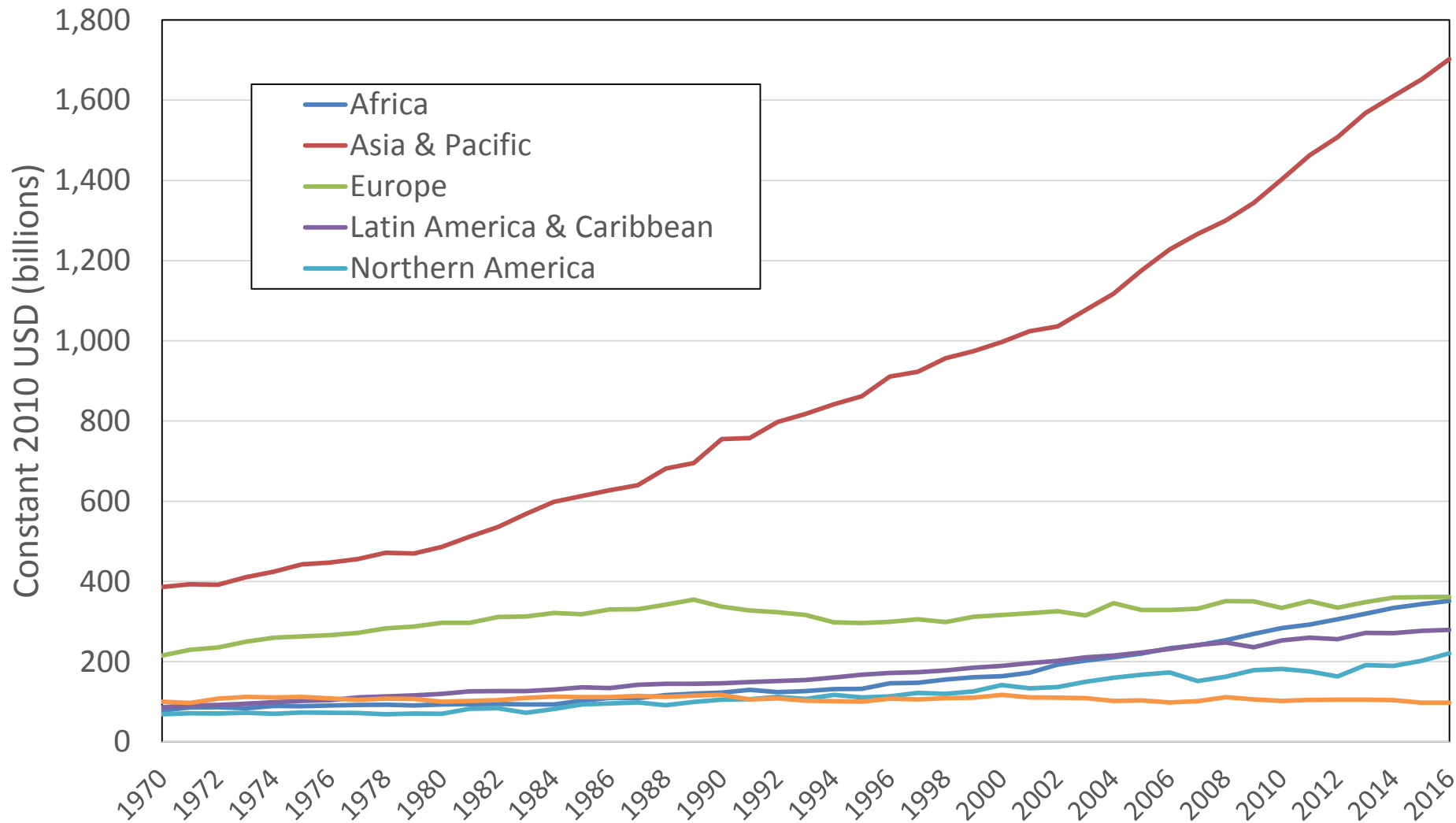
Why collect producer prices? Particularly as agriculture declines as a share of the economy?

- Importance of agriculture for food security; rural employment;
 - Impact of food price volatility on political/social stability
 - Input to calculating value of production, measuring agriculture GDP, calculating cost of production
 - Importance of region's contribution to global agriculture
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Asia & Pacific region's agriculture share of GDP fell to 8% ...



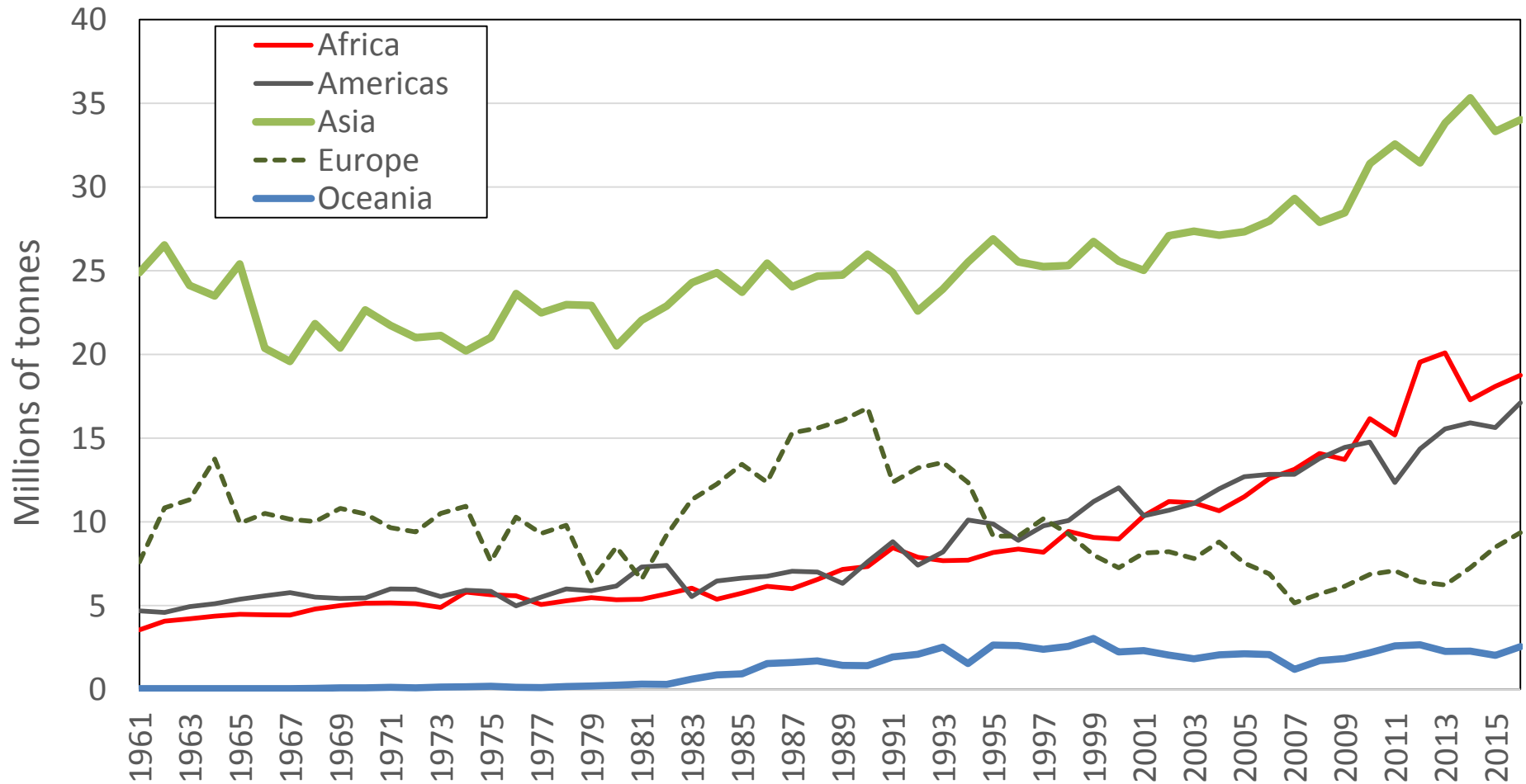
... but region's share of global Agriculture rose to over 50%



Source: [United Nations Statistics Division](#) and [Food and Agriculture Organization](#)

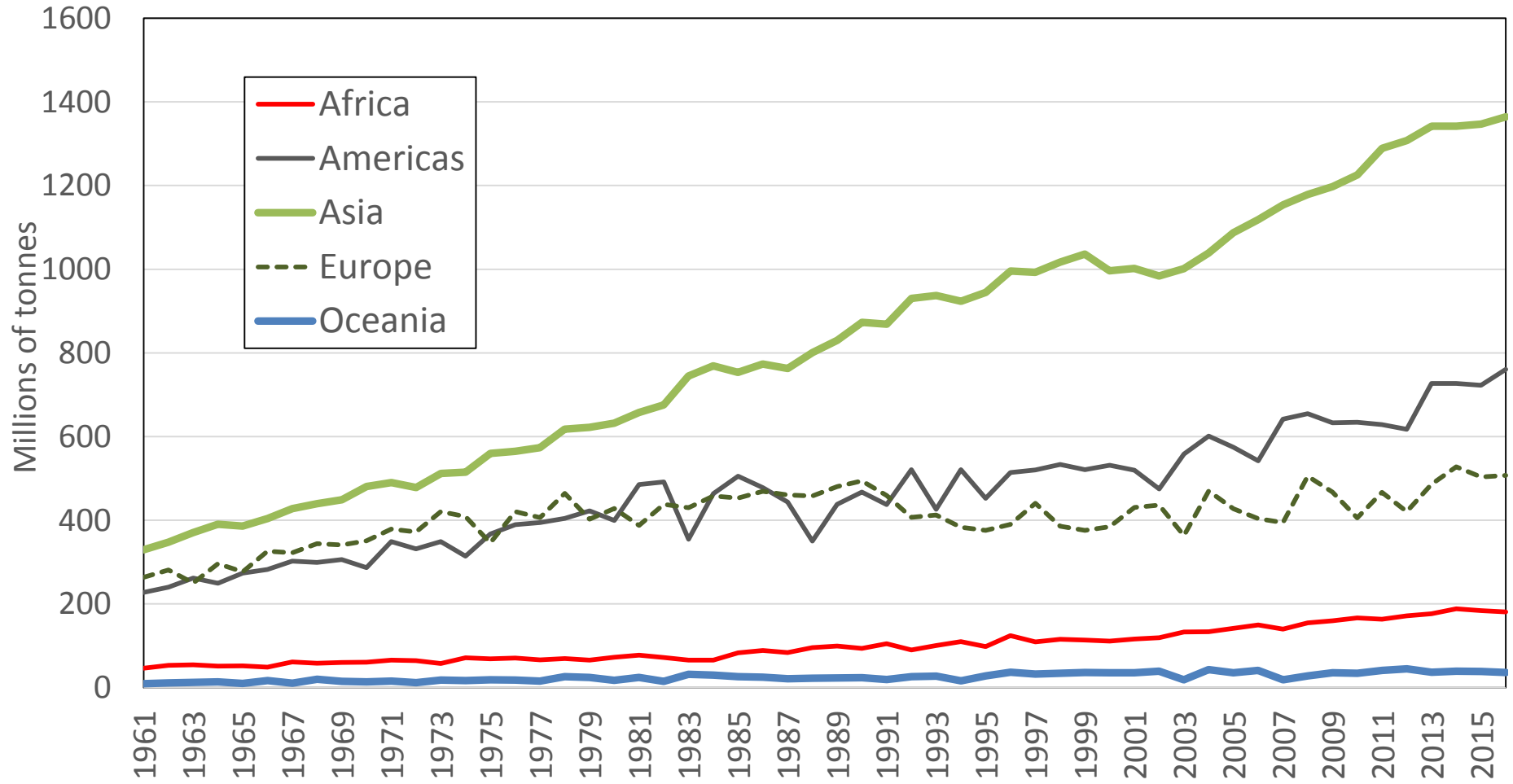
Asia & Pacific dominated in global pulse production ...

Global Pulse Production, millions of Tonnes, 1961-2016



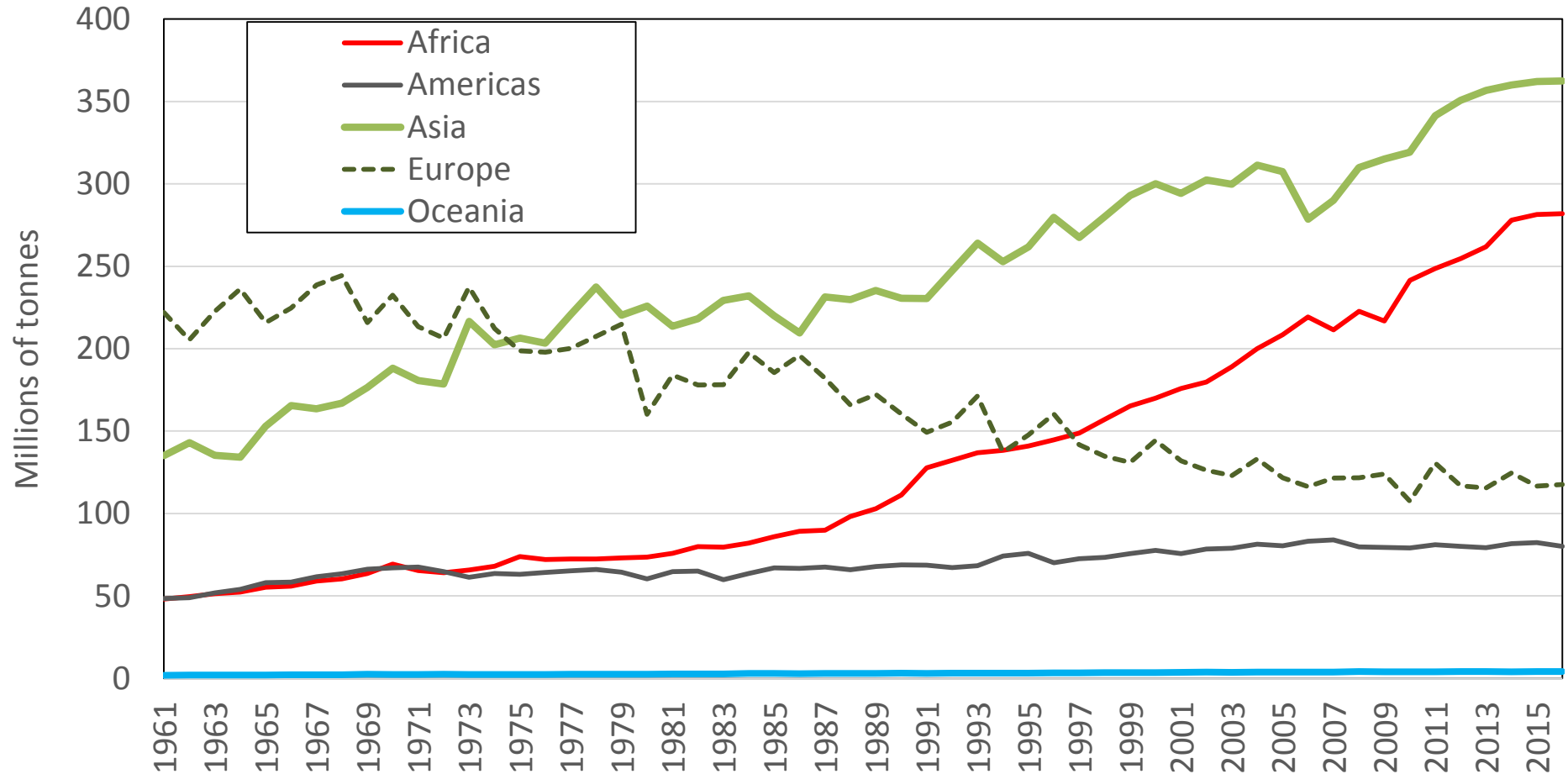
... increased its domination in global cereal production ...

Global Cereal Production, millions of Tonnes, 1961-2016



... and grew to dominate in roots' and tubers' production ...

Roots & Tubers' Production, millions of Tonnes, 1961-2016





USERS AND USES OF AGRICULTURE PRODUCER PRICES

Government

- Short-term measure of inflationary trends
- Policy development and monitoring (e.g. food security, minimum price support, value of production, Ag GDP)

Farmers

- Inform decisions on what to grow, when and where to sell, overall profitability

Business Community

- Forecast market conditions; determine input and food supply contracts; inform lending and insurance decisions

Researchers / Academics

- Study policy issues such as food security, price transmission, price volatility

A globally comparable dataset on agriculture producer prices, absolute levels and price indexes, also enables comparisons between countries of prices, price inflation and price transmission



WHAT IS AN AGRICULTURE PRODUCER PRICE?

The price received by farmers, livestock & poultry raisers for the sale of their produce at the first point of sale - *preferably a farm-gate price (FAO)*

The average price received by farmers in the domestic market for a specific agricultural commodity produced within a specified period. This price is measured at the farm gate — that is, at the point where the commodity leaves the farm — and therefore does not incorporate the costs of transport and processing. (*OECD Glossary of Statistical Terms*)

Considerations

- Best measured *after* a sale/transaction occurs to get **actual** price received
- Tax & subsidy treatment depends on price concept (producer vs basic price).
- For sales *after the farm gate*, exclude the portion of price on post farm-gate related costs: storage, transportation, wholesale margins, market dues, etc.



WHAT ARE BASIC PRICES VERSUS PRODUCER PRICES?

1. **Basic price** = amount received by producer from a purchaser for a unit of good or service produced as output.
 - includes subsidies and taxes on *production*.
 - excludes taxes on products, other subsidies on production, suppliers' retail and wholesale margins, and separately invoiced transport and insurance charges.
2. **Producer price** = **Basic price** - VAT or similar deductible tax, usually invoiced to the purchaser.
 - In agriculture, also known as farm-gate prices, or the price a farmer would receive if he/she sold the commodity at their farm.

Considerations

- Practices vary across countries on use of producer vs basic vs other prices
- The producer price may be simpler to collect.
- The price concept used impacts what information should be collected.



PRODUCER PRICE INDEX COMPILATION

Laspeyres index:

- *Weight=share of base year value of production*
- *Production data for to*

$$PPI_t^L = \frac{\sum P_{ti} Q_{oi}}{\sum P_{oi} Q_{oi}}$$

Paasche index:

- *Weight=share of current year value of production*
- *Annual production data*

$$PPI_t^P = \frac{\sum P_{ti} Q_{ti}}{\sum P_{oi} Q_{ti}}$$

Fisher index:

- *Geometric average of the Laspeyres and Paasche Indices*

$$PPI_t^F = \sqrt{PPI_t^P * PPI_t^L}$$

Use 3 year weighted average to smooth through volatility in agriculture production



USE OF MODIFIED LASPEYRES

$$\begin{aligned} PPI_t^L &= \frac{\sum P_{ti} Q_{oi}}{\sum P_{oi} Q_{oi}} \\ &= \sum \left(\frac{P_{oi} Q_{oi}}{\sum P_{oi} Q_{oi}} \right) \left(\frac{P_{ti}}{P_{oi}} \right) \\ &= \sum (s_{oi}) \left(\frac{P_{ti}}{P_{oi}} \right) \end{aligned}$$

- Base period may be a year, while prices are monthly or quarterly (modified Laspeyres)
- Use (3 year) weighted average of base period to smooth through agriculture volatility



POTENTIAL INDICATORS

1. National PPIs,
2. Sub-national PPIs and/or PPIs for commodity groups
3. Absolute price levels for commodities at national level
(requires much larger sample size)
4. May choose to disseminate less frequently than price data is collected; e.g. publish monthly PPIs based on weekly data collection; quarterly or annual PPIs based on monthly data collection.

The above will determine sample size and influence the sampling strategy



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- Determine commodities of interest and level of sub-national aggregation.

Multi-stage sampling

1. For each region and commodity, sample representative producers based on a sampling frame.
 - Producers stratified in three groups: Large, medium, small.
 - PPI manuals recommend use of Poisson sampling (sampling proportionate to size)
 - In many areas of production, a small number of large producers account for >60 of value of production; the plurality of small producers account for <10%.
 - “Take all” large producers; “take some” medium producers; “take none” small
 2. For each producer, select a typical sample of products sold (usually a judgmental sample determined by the producer), and collect the price received
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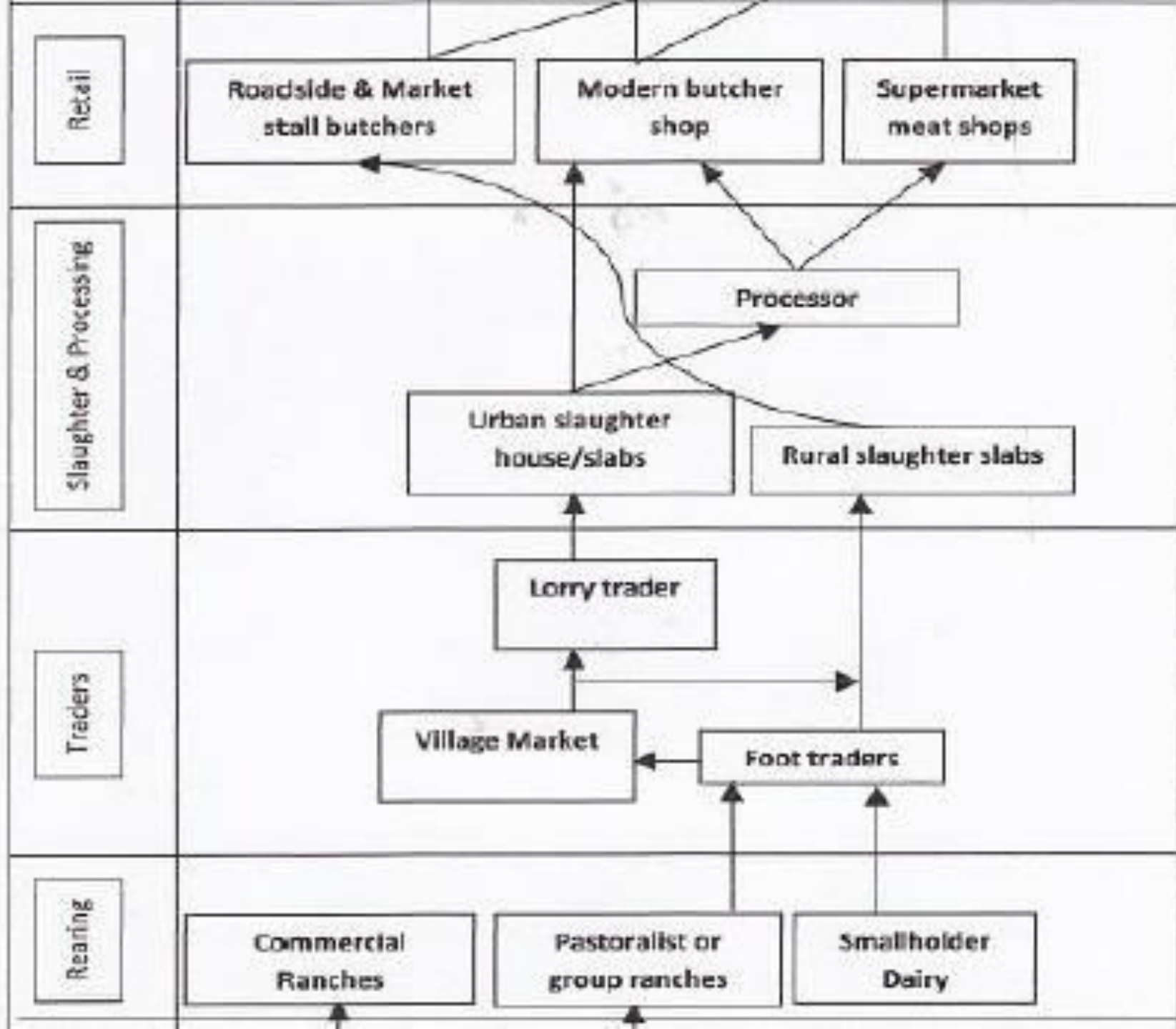
SAMPLING STRATEGY IN THIN MARKETS

- What if small producers have a significant share of value of production?
 - Must sample small producers
 - What if small producers sell infrequently? Farmers who own 1 or 2 cows; who only occasionally sell surplus produce, etc.
 - Implies large sample size to find producer engaged in sale
 - Alternative - sample at point of sale: wholesale market, retail market, slaughter house., etc.
 - Requires knowledge of commodity value-chain
 - Sampling approach per commodity and region
 - Sample representative markets (instead of small producers)
 - Sample representative traders (purposive or judgemental)
 - Judgemental sample of sales of a commodity (data on price paid by trader, VAT, market dues, transport costs, etc.)
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Challenges in collecting and compiling producer prices

- Weighting of commodities and commodity groups; the SUT versus Agriculture Census versus annual survey data
 - Standardizing non-standard units of measure (bags of rice; cups of lentil; bunches of bananas)
 - Adjusting for quality variations across an agricultural product
 - Seasonality (on/off) of agricultural commodities
 - Excluding imported products
 - Understanding a commodity value chain
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Benefits in compiling PPIs using market data

- Enables integration of market information system/
market prices and producer price statistics programs
 - Reduce duplication; enhance consistency
 - Introduce statistical robustness into market price
data
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Thank you