Indonesia Potential of Food Commodities

Purwiyatno Hariyadi
phariyadi.staff.ipb.ac.id

Email: phariyadi@ipb.ac.id

Indonesia Potential of Food Commodities

Purwiyatno Hariyadi
phariyadi.staff.ipb.ac.id

Email: phariyadi@ipb.ac.id
Indonesia Potential of Food Commodities

Indonesia Agriculture Snapshot

- Contribution to GDP\(^1\): 15% (2013)
- Contribution to Exports: 4% (2011)
- Number Employed in the Sector: 46 million (2012)
- Main Products: Palm Oil, Rubber, Cocoa, Cassava, Coffee, Tea, Tobacco, Rice.
- Main Export Markets: China, USA, Japan, Singapore, Korea, EU.

\(^1\) GDP (The gross domestic product) is one the primary indicators used to gauge the health of a country's economy. It represents the total dollar value of all goods and services produced over a specific time period - you can think of it as the size of the economy.

Indonesia Potential of Food Commodities

- Indonesia's abundance and variety of commodities is a vital asset to the country's economy (and government revenues) as commodities account for around 60 percent of exports.
### Indonesia Potential of Food Commodities

<table>
<thead>
<tr>
<th>Food Commodity</th>
<th>Indonesian Production or Reserves (R)</th>
<th>Global Production or Reserves (R)</th>
<th>Indonesia's Share of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palm Oil</td>
<td>23.9 million MT</td>
<td>48.9 million MT</td>
<td>48.9%</td>
</tr>
<tr>
<td>Cocoa</td>
<td>0.48 million MT</td>
<td>3.96 million MT</td>
<td>12.2%</td>
</tr>
<tr>
<td>Rice</td>
<td>65.4 million MT</td>
<td>672.0 million MT</td>
<td>9.7%</td>
</tr>
<tr>
<td>Coffee</td>
<td>8.25 million bags</td>
<td>131.25 million bags</td>
<td>6.3%</td>
</tr>
<tr>
<td>Tea</td>
<td>0.14 million MT</td>
<td>4.20 million MT</td>
<td>2.8%</td>
</tr>
</tbody>
</table>

More....
- Spices – paper, nutmeg and/mace
- Tropical fruits, etc.
Indonesia Potential of Food Commodities

<table>
<thead>
<tr>
<th>Food Commodity</th>
<th>Indonesian Production or Reserves (R)</th>
<th>Global Production or Reserves (R)</th>
<th>Indonesia's Share of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palm Oil</td>
<td>23.9 million MT</td>
<td>48.9 million MT</td>
<td>48.9%</td>
</tr>
<tr>
<td>Cocoa</td>
<td>0.48 million MT</td>
<td>3.96 million MT</td>
<td>12.2%</td>
</tr>
<tr>
<td>Rice</td>
<td>65.4 million MT</td>
<td>672.0 million MT</td>
<td>9.7%</td>
</tr>
<tr>
<td>Coffee</td>
<td>8.25 million bags</td>
<td>131.25 million bags</td>
<td>6.3%</td>
</tr>
<tr>
<td>Tea</td>
<td>0.14 million MT</td>
<td>4.20 million MT</td>
<td>2.8%</td>
</tr>
</tbody>
</table>

June 25/2014:
• Focus on (i) Cocoa, (ii) Rice, (iii) Coffee, (iv) Tea, and (v) other (spices, tropical fruits and seafood)

June 27/2014:
• Focus on Palm Oil

Cocoa
• The cocoa bean, fruit of the cocoa tree, acquired economic importance because it forms an essential element for the taste of chocolate, a worldwide popular delicacy.
• Three main varieties of cocoa beans:
  (i) Forastero
  (ii) Criollo, and
  (iii) Trinitario.
• Forastero is the most widely used variety of cocoa comprising around 90% of cocoa's world production.
Cocoa

- Forastero:
  - Inferior to the other cocoa types
  - Bigger size of beans, and
  - Much more resistant to diseases.

- The Criollo variety is considered as the highest quality cocoa bean but it has lower yields than those of Forastero, while also being less resistant to several diseases.


Most of the global cocoa production originates from the African continent.

Throughout the cocoa bean history, most of these beans have been exported to Europe (in particular Germany and the Netherlands) and the USA for grinding processing.

Recently, however, Africa is emerging as the top processor of cocoa beans.
### Cocoa

**Estimated Cocoa Production 2011/2012 (in MT)**

Source: International Cocoa Organization (ICCO)

<table>
<thead>
<tr>
<th>Country</th>
<th>Production (MT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Yvory Coast</td>
<td>1,410,000</td>
</tr>
<tr>
<td>2. Ghana</td>
<td>860,000</td>
</tr>
<tr>
<td>3. Indonesia</td>
<td>480,000</td>
</tr>
<tr>
<td>4. Nigeria</td>
<td>210,000</td>
</tr>
</tbody>
</table>

### Cocoa In Indonesia

- The cocoa bean is one of the most important agricultural export products of Indonesia.
- In the past 25 years, the Indonesian cocoa sector has experienced massive growth, driven by rapid expansion of smallholder farmer participation.
- Indonesian smallholders contribute - by far - most of the national production, thus outperforming big state plantations and large private estates.
- The country currently has approximately 1.5 million hectares of cocoa plantations.
Cocoa In Indonesia

Main cocoa producer in Indonesia:
1. Sulawesi, 2. North Sumatra, 3. West Java
4. Papua, 5. East Kalimantan

- Sulawesi: accounts for around 75% of Indonesia’s total cocoa production.
- Indonesia’s cocoa productivity (per hectare) is less than that of other cocoa-producing countries
- Government started a five-year cocoa revitalization program in 2009 to boost production through:
  i. Intensification
  ii. Rehabilitation, and
  iii. rejuvenation activities
Cocoa In Indonesia

Factors that are hampering progress in the cocoa industry are aging trees (planted in the 1980s), insufficient improved planting materials and little farm maintenance.

More investment in this sector is needed to reach the government's one million tonnes annual production target by 2013-2014.

Cocoa forms Indonesia's fourth largest foreign exchange earning from the agriculture sector (after palm oil, rubber and coconut).

Majority of Indonesia's cocoa export constitutes raw beans (instead of processed cocoa).

Important export destination: Malaysia, the USA and Singapore.

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Production (in tonnes)</td>
<td>575,000</td>
<td>435,000</td>
<td>500,000¹</td>
<td>575,000¹</td>
</tr>
<tr>
<td>National Export (in tonnes)</td>
<td>280,000</td>
<td>200,000</td>
<td>120,000¹</td>
<td></td>
</tr>
</tbody>
</table>

Sources:
Indonesia Cocoa Association and Indonesian Coffee and Cocoa Research Institute
Cocoa ... product knowledge

Family – Sterculiaceae
Genus – Theobroma
Species - cacao
Cocoa ... product knowledge

Each Seed (Bean) is Covered by a White Mucilage
Cocoa ... product knowledge

What’s in the cocoa bean?

54% Fat (Cocoa Butter)
31% Carbohydrates
11% Protein
3% Polyphenols
< 1% Minerals

34% Oleic Acid
33% Stearic Acid
26% Palmitic Acid
6% Other

~1% Sugar, 16% Fiber

Arginine, Glutamine, Leucine
Flavanols, Proanthocyanins
Fe, Mg, P, K, Cu
1 Cocoa ... product knowledge

Flavonoid/Flavanol compounds are classified as antioxidants, which are compounds that can scavenge or neutralize free radicals. (Free radicals have lost electrons making them very reactive and cause cell damage.)

Antioxidants found in fruits and vegetables in addition to chocolate, tea, and wine, have been studied for their free radical scavenging ability associated with cardiovascular disease and cancer.

Dark chocolate products in general contains higher amounts of these compounds than milk chocolate products.

• Psychological studies in humans have described links between intake of flavanol-rich cocoa-derived products such as dark chocolate and improved mood, while behavioral studies in laboratory animals have reported antidepressant effects of flavanols.

• It is therefore likely that flavanol-rich cocoa-derived products such as dark chocolate may have beneficial effects as add-on items together with traditional antidepressant regimes.
Dietary flavonoids, abundant in plant-based foods, have been shown to improve cognitive function. Specifically, a reduction in the risk of dementia, enhanced performance on some cognitive tests, and improved cognitive function in elderly patients with mild impairment have been associated with a regular intake of flavonoids. A subclass of flavonoids called flavanols, which are widely present in cocoa, green tea, red wine, and some fruits, seems to be effective in slowing down or even reversing the reductions in cognitive performance that occur with aging. Dietary flavonoids have also been shown to improve endothelial function and reduce the risk of cardiovascular disease.
1 Cocoa ... product knowledge

2 Rice

- Rice is one of the world's most important staple food products.
- Rice cultivation is well-suited to regions that have a warm climate, low labor costs and high amounts of rainfall as this staple crop is labor-intensive to cultivate and requires an ample water supply.
2 Rice

- Regions that meet these requirements are mainly found in Asia.
- Asia: rice is the main staple food for the majority of the population (in particular the poorer segments of society)
- A characteristic of Asian rice farmers is that the majority originates from poor environments and lives in underdeveloped conditions.

Country Numbers are in unmilled MT

<table>
<thead>
<tr>
<th>Country</th>
<th>Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. China</td>
<td>197,221,000</td>
</tr>
<tr>
<td>2. India</td>
<td>120,620,000</td>
</tr>
<tr>
<td>3. Indonesia</td>
<td>66,411,500</td>
</tr>
<tr>
<td>4. Bangladesh</td>
<td>49,355,000</td>
</tr>
<tr>
<td>5. Vietnam</td>
<td>39,988,900</td>
</tr>
</tbody>
</table>

Source: Food and Agriculture Organization of the United Nations (2010)
2 Rice in Indonesia

• Indonesia is the third-largest country regarding global rice production

• It is still a rice importer:
  (i) farmers' use of non-optimal production techniques,
  (ii) large per capita rice consumption, and
  (iii) large population.

2 Rice in Indonesia

• Indonesia has the largest per capita rice consumption in the world with Indonesians consuming around 140 kilogram of rice per person per year.

• Smallholder farmers account for around 90 percent of Indonesia's rice production, each holding an average land area of less than 0.8 hectares.

<table>
<thead>
<tr>
<th>Year</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2015 (a forecast)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice Production (in millions of unmilled MT of rice)</td>
<td>60.3</td>
<td>64.4</td>
<td>66.4</td>
<td>65.4</td>
<td>69.1</td>
<td>72.1</td>
<td></td>
</tr>
</tbody>
</table>

Sources: Food and Agriculture Organization of the United Nations and Indonesian Ministry of Agriculture
2 Rice in Indonesia

Indonesian provinces where most rice is produced are:


- Indonesia consumes large quantities of rice → top priority on reaching self-sufficiency in rice → aims to become a rice exporter.
- Indonesia has been striving to reach rice self-sufficiency but only succeeded in the mid-1980s and 2008-2009.
- In recent years Indonesia has needed to import around three million tonnes of rice annually, mainly from Thailand and Vietnam, to satisfy the country's rice reserves.
- These imports are handled by state procurement agency BULOG (National Logistics Agency).
2 Rice ... Product Knowledge

*Oryza sativa*, commonly known as *Asian rice*, is the plant species most commonly referred to in English as rice.
Rice ... Product Knowledge
2 Rice ... Product Knowledge

- Clean paddy
- Brown rice with unhusked kernels
- Immature grain
- Clean brown rice

A: (1) Chaff
(2) Bran
(3) Bran residue
(4) Cereal germ
(5) Endosperm
2 Rice ... Product Knowledge

[Diagram showing different types of rice and their classification]

2 Rice ... Product Knowledge

[Diagram showing different types of rice and their classification]
2 Rice ... Product Knowledge

3 Coffee

- Important beverage around the globe.
- Important for its economic value, especially for the coffee bean producing and exporting countries (such as Indonesia).
- Coffee beans produced by the coffee plant (flowering plant of the Rubiaceae family) sometime called the world's "second most legally traded commodity" in human history.
- Main coffee beans arabica and robusta (differ in its taste and the level of caffeine).
Coffee

- **Arabica** beans → more expensive, milder taste, and contain less caffeine than **robusta** beans.
- The subtropical and equatorial regions → suitable for coffee plantation
- The world's coffee production:
  1. South America,
  2. Africa, and

Top 5 Coffee Bean Producers in Crop Year 2012-2013

<table>
<thead>
<tr>
<th>Country</th>
<th>Production (in bags of 60 kilogram)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Brazil</td>
<td>50,826,000</td>
</tr>
<tr>
<td>2. Vietnam</td>
<td>22,000,000</td>
</tr>
<tr>
<td>3. Indonesia</td>
<td>12,730,000</td>
</tr>
<tr>
<td>4. Ethiopia</td>
<td>9,500,000</td>
</tr>
<tr>
<td>5. Colombia</td>
<td>8,100,000</td>
</tr>
</tbody>
</table>

Source: International Coffee Organization
Coffee

Top 5 Coffee Bean Exporting Countries in 2012

<table>
<thead>
<tr>
<th>Country</th>
<th>Total Export (in bags of 60 kilogram)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Brazil</td>
<td>28,333,000</td>
</tr>
<tr>
<td>2. Vietnam</td>
<td>25,475,000</td>
</tr>
<tr>
<td>3. Indonesia</td>
<td>10,614,000</td>
</tr>
<tr>
<td>4. Colombia</td>
<td>7,170,000</td>
</tr>
<tr>
<td>5. Honduras</td>
<td>5,508,000</td>
</tr>
</tbody>
</table>

Source: International Coffee Organization

Coffee in Indonesia

- Indonesia is one of the world's top coffee producing and exporting countries.
- Indonesia is also famous for having a number of specialty coffees such as 'kopi luwak' (the most expensive coffee in the world) and 'kopi Mandailing'.
- More ......
- http://www.luwakcafe.com/about/
- http://mandailingestatecoffee.com/
Coffee in Indonesia

• Coffee was introduced to Indonesia by the Dutch.
• Initially planted coffee trees around Batavia (Jakarta) but quickly expanded to Bogor and Sukabumi regions in West Java in the 17th and 18th century.
• Indonesia have ideal climate for coffee production → plantations were soon established on other parts of Java and the islands of Sumatra and Sulawesi.
• Indonesia's coffee plantations cover approximately 1.3 million hectares in total.
• More than 90 percent of these plantations are cultivated by small-scale producers.

Coffee in Indonesia

Main coffee producer of Indonesia:

<table>
<thead>
<tr>
<th>Robusta</th>
<th>Arabica</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bengkulu (Sumatra)</td>
<td>a. Aceh (Sumatra)</td>
</tr>
<tr>
<td>2. South Sulawesi</td>
<td>b. North Sumatra</td>
</tr>
<tr>
<td>3. Lampung (Sumatra)</td>
<td></td>
</tr>
</tbody>
</table>

Map showing coffee production areas in Indonesia.
3 Coffee in Indonesia

• Starting from the 1960s, Indonesia has shown a small but stable increase in domestic production of coffee.
  • Problem → the size of coffee estates in Indonesia are in decline as farmers have become more interested in the oil palm, rubber and cocoa which all have higher yields on the international market.
  • In 2012: ~ 70% of Indonesia's coffee bean was exported to Japan, South Africa, Western Europe and the USA.
  • Problem: Around 80 percent of this export consists of the lower-quality Robusta type.

<table>
<thead>
<tr>
<th>Year</th>
<th>National Production (in MT)</th>
<th>National Export (in MT)</th>
<th>Value of Export (in million US dollar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>698,016</td>
<td>491,335</td>
<td>1,077.7</td>
</tr>
<tr>
<td>2009</td>
<td>682,690</td>
<td>518,122</td>
<td>882.1</td>
</tr>
<tr>
<td>2010</td>
<td>686,921</td>
<td>440,241</td>
<td>855.2</td>
</tr>
<tr>
<td>2011</td>
<td>633,991</td>
<td>353,698</td>
<td>1,085.9</td>
</tr>
<tr>
<td>2012</td>
<td>748,109</td>
<td>520,275</td>
<td>1,534.1</td>
</tr>
<tr>
<td>2013</td>
<td>728,000</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Asosiasi Eksportir dan Industri Kopi Indonesia (AEKI)
3 Coffee in Indonesia

- Domestic consumption of coffee in Indonesia has always been relatively low, but it is increasing by ~20%/year.
- Per capita consumption of coffee in 2012:
  - Indonesia: 0.95 kilogram
  - Finland: 11.70 kilogram (highest global per capita coffee consumption)
- Currently around 30 percent of national production is consumed domestically.

<table>
<thead>
<tr>
<th>Year</th>
<th>National Consumption (bags of 60 kilogram)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008/2009</td>
<td>1,890,000</td>
</tr>
<tr>
<td>2009/2010</td>
<td>1,940,000</td>
</tr>
<tr>
<td>2010/2011</td>
<td>1,700,000</td>
</tr>
<tr>
<td>2011/2012</td>
<td>2,355,000</td>
</tr>
<tr>
<td>2012/2013¹</td>
<td>2,540,000</td>
</tr>
</tbody>
</table>

Source: United States Department of Agriculture (USDA)
Coffee ... Product Knowledge

Coffee ... Product Knowledge
Coffee ... Product Knowledge

- **Arabica, *C. arabica***
  - Ethiopia highlands
    - >1600m
    - 15-24°C
    - 1300 mm
  - Best quality
  - Susceptible to rust

- **Robusta, *C. canephora***
  - Rain forest of Congo basin
    - <750m
    - 24-30°C
    - 1550 mm
  - Less flavor, acidity
  - Resistant to rust

Coffee Bean Structure:
1. Center cut
2. Bean (endosperm)
3. Silver skin (testa epidermis)
4. Parchment (hull/endocarp)
5. Pectin Layer
6. Pulp (mesocarp)
7. Outerskin (pericarp/exocarp)
3 Coffee ... Product Knowledge

HARVESTING

DEPULING

FERMENTING

SORTING

HULLING

DRYING

QUALITY TESTING

ROASTING

BREW & ENJOY!
### Coffee ... Product Knowledge

#### Production/Value Chain

- **Coffee Cherry & Beans**
  - Arabica: High Aroma, Medium Price
  - Robusta: High Yield, Low Price

- **Extraction**

- **Roasting & G & R**

- **Stock Exchange & Stock**

- **Farming & Picking**

- **Depulping**

- **Liquid to Instant**

- **Solid to Liquid**

- **Starch to Sugar**

- **Instant Coffee**

---

### Coffee ... Product Knowledge

- **Caffeine Reduction**
  - Add water to beans
  - Extract with
    - Methylene chloride and ethyl acetate
    - Residual solvent removed via low level steam drying
  - Caffeine can be recovered with water extraction of organic solvent
3 Coffee ... Product Knowledge

- Instant Coffee
  - Extract soluble solids, volatile aroma and flavor with water
- Drying
  - Drum drying - poor appearance
  - Spray drying - loses flavor volatiles
  - Freeze drying - best product
    - Best retention of flavor
    - Produces granules
    - No evaporation so no loss of flavor
    - Coffee oil for head space aroma

4 Tea

- Camellia sinensis
  - One of the world's most consumed beverages.
  - Originated from China, where tea has been drunk for thousands of years.
  - Around the 16th century, Portuguese brought this beverage to Europe and quickly gained popularity.
  - This popularity made the Portuguese and the Dutch decide to establish large-scale tea plantations in their tropical colonies.
4 Tea

• Constant temperatures and humidity are ideal conditions for the tea plant to grow ➔ the tropical and subtropical climates in Asia (> 60% of global tea production is cultivated).
  • In particular, the cooler highlands will produce a good quality of tea leaves.

• The tea plant can be first harvested after it has reached the age of around four years.
  • Only young leaves are selected ➔ manual picking is more efficient than using mechanical equipment. ➔ Tea production is therefore a labor-intensive business.
4 Tea

Two countries that dominate the global tea production are China and India. Together these two countries account for almost half of global tea production.

Top Eight Tea Producers in 2011

<table>
<thead>
<tr>
<th>Country</th>
<th>Production (in metric tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. China</td>
<td>1,640,310</td>
</tr>
<tr>
<td>2. India</td>
<td>966,733</td>
</tr>
<tr>
<td>3. Kenya</td>
<td>377,912</td>
</tr>
<tr>
<td>4. Sri Lanka</td>
<td>327,500</td>
</tr>
<tr>
<td>5. Turkey</td>
<td>221,600</td>
</tr>
<tr>
<td>6. Vietnam</td>
<td>206,600</td>
</tr>
<tr>
<td>7. Iran</td>
<td>162,517</td>
</tr>
<tr>
<td>8. Indonesia</td>
<td>142,400</td>
</tr>
</tbody>
</table>

Source: Food and Agriculture Organization of the United Nations

4 Tea in Indonesia

Production and Export of Indonesian Tea

- Indonesia: ranks **eight** as the largest tea producers.
  - Problem: Tea estates have also been given up for the production of vegetables and other crops that are considered more profitable.
    - Despite the resulting decrease in land acreage tea production has remained relatively stable.
    - This indicates that the remaining tea estates have become more productive.
### Tea in Indonesia

Production and Export of Indonesian Tea

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesian Tea</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production (in MT)</td>
<td>150,623</td>
<td>153,971</td>
<td>156,904</td>
<td>150,342</td>
<td>142,400</td>
</tr>
</tbody>
</table>

Sources: Food and Agriculture Organization of the United Nations

The provinces that produce most of Indonesia's total tea output are:

1. **West Java** (produces around 70 percent of national tea production),
2. **Central Java**, and
3. **North Sumatra**
**4 Tea in Indonesia**

- Approximately 65 percent of the Indonesian tea production is exported to (1) Russia, (2) Great Britain, and (3) Pakistan.
  - Export is dominated by large plantations, both state-owned and private, while the majority of smallholders are more oriented towards the domestic market (which is not big as Indonesia contains a low rate of per capita tea consumption).

---

**4 Tea ... product Knowledge**

**TEA - Camellia sinensis**

- Family - Theaceae
- Genus - Camellia
- Species - sinensis
Tea ... product Knowledge

- Perennial evergreen bush/tree
- Harvest young leaves

Tea ... product Knowledge

Fig. 14.4. The two normal standards for harvesting ('plucking') of tea leaves from the bushes.
4 Tea ... product Knowledge

- White Tea
- Green Tea
  - Not “fermented”
  - Only China type tea
  - Mainly China and Japan
- Oolong Tea
  - Semi “fermented”
  - Produced in Taiwan
- Black Tea (highest production)
  - “Fermented”
4 Tea ... product Knowledge

Tea Processing and Its Effects on Tea Polyphenol Content

- **White Tea** (buds or young leaves)
  - Steamed (oxidase inactivation) → Dried

- **Green Tea** (mature leaves)
  - Withered → Steamed or Panfried (oxidase inactivation) → Dried

- **Oolong Tea** (mature leaves)
  - Withered → Bruised → Partially Panfried → Dried Fermented

- **Black Tea** (mature leaves)
  - Withered → Rolled → Fully Fired → Dried Fermented

Teaflavins & Thearubigins

5 Others

- Fruit and vegetables

Image of various fruits and vegetables.
5 Others

YOUR PARTNER IN INDONESIA FOR SUGAR SPICES AND OTHER NATURAL INGREDIENTS

*Hold mouse over the image for more details*
5 Others

[Image of nutmeg and cardamom]

World Nutmeg, Mace & Cardamoms Production

- Top 10 producing countries
  - Guatemala
  - India
  - Indonesia
  - Nepal
  - Bhutan
  - Lao
  - Grenada
  - Tanzania
  - Malaysia
  - Sri Lanka

2008
2009

Tonnes
30,000
25,000
20,000
15,000
10,000
5,000
0
5 Others

Banana and Plantain

- Banana
  - Desert banana, fresh consumption
- Plantain
  - Cooking, Meal, Vegetable banana

---

<table>
<thead>
<tr>
<th>Region</th>
<th>Bananas</th>
<th>Plantains</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>Burundi, Uganda, Egypt, Cameroon, Congo</td>
<td>Uganda, Rwanda, Ghana, Nigeria, Ivory Coast</td>
</tr>
<tr>
<td>Asia</td>
<td>India, Philippines, China, <strong>Indonesia</strong>, Thailand</td>
<td>Myanmar, Sri Lanka</td>
</tr>
<tr>
<td>Americas</td>
<td>Ecuador, Brazil, Costa Rica, Colombia, Guatemala</td>
<td>Colombia, Peru, Venezuela, Ecuador, Cuba</td>
</tr>
</tbody>
</table>

FAOSTAT database, 2000-2002
## Banana and Plantain ... world production (%)

<table>
<thead>
<tr>
<th>Region</th>
<th>Bananas</th>
<th>Plantains</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>10%</td>
<td>89%</td>
</tr>
<tr>
<td>Asia</td>
<td>56%</td>
<td>4%</td>
</tr>
<tr>
<td>Americas</td>
<td>34%</td>
<td>7%</td>
</tr>
<tr>
<td>Total (1,000s mt)</td>
<td>72,167</td>
<td>25,309</td>
</tr>
</tbody>
</table>

FAOSTAT database, 2000-2002
5 Others

Potential Fish Production of INDONESIA

More:

5 Others ..... More

Go to
Statistics of Indonesia
http://www.bps.go.id/eng/

Thank you ....
phariyadi.staff.ipb.ac.id