Agricultural Production Enhancement in ASEAN by Smart Farming
With rising populations, increasing food prices and environmental concerns, Asia's agricultural sector faces a raft of challenges (Asian Development Bank)

(1) More than 2.2 billion people in the Asia rely on agriculture for their livelihoods.

(2) Rice is by far the most important crop throughout Asia - 90% of the world's production and consumption occurs in this region.

(3) In 2011, it was estimated biotech crops were grown on 160 million hectares of land - making it the fastest adopted crop technology.
Demand of Food & Agricultural Sustainable Goals

There are 4 key sustainability goals:

Satisfy human food needs, and contribute to biofuel needs

Enhance environmental quality

Sustain the economic viability of agriculture

Enhance the quality of life for farmers, farm workers and society as a whole

FAO predicts that Food production must increase by 70% by 2050
Agricultural Products & Its Value Added Products in ASEAN

I. Most Agricultural Products Export (2014)

- **Palm oil**: 29,857,800,000.00
- **Crude rubber**: 14,194,200,000.00
- **Rice, including husked and broken rice**: 34,018,000,000.00

Total of 53,102,000,000.00 (US Currency)

ASEAN produces 89% of global production

ASEAN produces 75% of global production

ASIA covers 90% of global production and consumption

II. Agricultural Value Added in current USD (2014, 2015 and 2016)

- **2014**: 280,662,941,096.30
- **2015**: 263,254,222,664.90
- **2016**: 274,393,199,571.70

2014 2015 2016
Agricultural Value Added in US Dollar in 2016

<table>
<thead>
<tr>
<th>Country</th>
<th>Agricultural Value Added in US Dollar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brunei Darussalam</td>
<td>137 M</td>
</tr>
<tr>
<td>Cambodia</td>
<td>4,953 M</td>
</tr>
<tr>
<td>Indonesia</td>
<td>125,410 M</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>2,740 M</td>
</tr>
<tr>
<td>Malaysia</td>
<td>25,622 M</td>
</tr>
<tr>
<td>Myanmar</td>
<td>19,015 M</td>
</tr>
<tr>
<td>Philippines</td>
<td>29,428 M</td>
</tr>
<tr>
<td>Singapore</td>
<td>102 M</td>
</tr>
<tr>
<td>Thailand</td>
<td>33,920 M</td>
</tr>
<tr>
<td>Vietnam</td>
<td>33,066 M</td>
</tr>
</tbody>
</table>
**Total EXPORT and IMPORT Value IN 2015**

- **Exports**: 1,182,031M
- **Imports**: 1,088,279M

**Balance of Trade**
- Export amount is slightly greater number than Import amount

**Trading Partner**
- China, USA, EU 28, Japan accounts top four of goods exporting destinations
- Export in Intra ASEAN itself is comparable to top four exporting destinations

**Compelling Reasons**
1. ASEAN exported **77,418 million U.S Dollar** of total Agricultural Products in 2014
2. ASEAN has been the **4th** trading partner with the United States
3. ASEAN occupied only **24 %** agricultural land of total land area
Since 1990 to 2014, Vietnam had expanded its agricultural land almost 15%, currently at 35.07%.
Suggestions & Solutions

1. Smart Farming with IOT (Internet of Things)

- Autonomous farming can reduce the cost of labors and eliminate the environmental limitations.
- Smart Farming can help farmers to track progress, analyze, and make adjustments to their crops remotely.
2. Vertical Farming

- Adapting it with **Organic Farming**, **Vertical Farming** will exponentially increase the production in both quantity and quality with less resources.

- Along with **Vertical / Hydroponic Farming** will exponentially reduce the cost of fertilizer, water and land needed to grow small crops.

- **Vertical Farming** will enable farmer to use less land area.
Conclusion

- Demand in food and agricultural products
- Positive data in agricultural production
- Technology enhancement in productivity
References

- ASEAN Secretariat
  ASEAN Exports of Selected Agricultural Products and Inputs by Countries, 2014

- World Bank
  World Development Indicator

Other minor sources: Food and Agricultural Organization of US, United Nations, brightagrotech.com, aerofarms.com, etc.