UNDERSTANDING FOOD SECURITY SITUATION IN THE PHILIPPINES

Domingo E. Angeles
Retired Professor of Crop Science
Sept 27, 2019 Seminar
<table>
<thead>
<tr>
<th>Year</th>
<th>Rank</th>
<th>Number of countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>63</td>
<td>105</td>
</tr>
<tr>
<td>2015</td>
<td>72</td>
<td>109</td>
</tr>
<tr>
<td>2017</td>
<td>72</td>
<td>113</td>
</tr>
</tbody>
</table>
Philippines

51.5 score

Figures are from annual baseline model (October 2018)

Explore the impact of GFN’s natural resources & resilience category

Strengths (7)

Score / 100

100 Nutritional standards
98.4 Volatility of agricultural production
96.8 Urban absorption capacity

View all strengths

Challenges (4)

- Public expenditure on agricultural R&D
- Corruption
- Gross domestic product per capita (US$ PPP)

View all challenges

74 category rank

AFFORDABILITY
46.3 category score

63 category rank

AVAILABILITY
55.6 category score

69 category rank

QUALITY AND SAFETY
- Malaysia 40
- Thailand 54
- Vietnam 62
- Indonesia 67

Percent of the population below the poverty line 2015

- Malaysia 1
- Thailand 14
- Vietnam 7
- Indonesia 11

Stunting in children under 5

- Malaysia 2016 22%
- Thailand 2015 12%
- Vietnam 2015 25%
- Indonesia 2013 38%
- Philippines 2015 33%

GLOBAL FOOD SECURITY INDEX 2018
Food Security defined

“EXISTS WHEN ALL PEOPLE, AT ALL TIMES, HAVE PHYSICAL, SOCIAL AND ECONOMIC ACCESS TO SUFFICIENT, SAFE AND NUTRITIOUS FOOD THAT MEETS THEIR DIETARY NEEDS AND FOOD PREFERENCES FOR AN ACTIVE AND HEALTHY LIFE.”

- UN
Elements/Dimension of food security

- **Availability** - trade, stocks, level of production
- **Accessibility** - income, market prices, distribution
- **Utilization** - food safety, eating habit, Food processing
- **Stability**
Why are we food insecure?
<table>
<thead>
<tr>
<th>POVERTY INCIDENCE</th>
<th>MALNUTRITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>National 21.6%</td>
<td>Underweight 21.6</td>
</tr>
<tr>
<td>Farmers 34.3%</td>
<td>Stunting 33.5</td>
</tr>
<tr>
<td>Fisherfolks 34%</td>
<td>Wasting 7.1</td>
</tr>
<tr>
<td></td>
<td>Overweight 3.8</td>
</tr>
<tr>
<td>P8,000/MONTH ¾ IN RURAL AREA</td>
<td>Children aged 26.2</td>
</tr>
<tr>
<td></td>
<td>0-12 yrs</td>
</tr>
</tbody>
</table>
GDP SHARE: 10% PRIMARY AGRICULTURE
30-35% AGGREGATE WITH HIGH VALUE DIVERSIFIED AGribusiness

SOURCE: COUNTRYSTAT.PSA
Yield levels (mt/ha)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>3.84</td>
<td>3.89</td>
<td>4.0</td>
<td>3.9</td>
<td>3.87</td>
</tr>
<tr>
<td>Corn</td>
<td>4.09</td>
<td>4.08</td>
<td>4.17</td>
<td>4.15</td>
<td>3.97</td>
</tr>
<tr>
<td>Banana</td>
<td>20.31</td>
<td>19.39</td>
<td>20.07</td>
<td>20.49</td>
<td>20.1</td>
</tr>
<tr>
<td>Mango</td>
<td>4.07</td>
<td>4.34</td>
<td>4.71</td>
<td>4.79</td>
<td>4.33</td>
</tr>
<tr>
<td>Pineapple</td>
<td>41.02</td>
<td>40.46</td>
<td>40.67</td>
<td>41.12</td>
<td>40.05</td>
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<tr>
<td>Coffee</td>
<td>0.74</td>
<td>0.68</td>
<td>0.64</td>
<td>0.64</td>
<td>0.60</td>
</tr>
<tr>
<td>Cacao</td>
<td>0.52</td>
<td>0.52</td>
<td>0.45</td>
<td>0.43</td>
<td>0.42</td>
</tr>
<tr>
<td>Coconut</td>
<td>4.44</td>
<td>4.32</td>
<td>4.2</td>
<td>4.19</td>
<td>3.88</td>
</tr>
<tr>
<td>Sugarcane</td>
<td>60.92</td>
<td>56.25</td>
<td>57.94</td>
<td>54.41</td>
<td>54.55</td>
</tr>
</tbody>
</table>
Are our yield levels at par with our ASEAN neighbors?
SUGARCANE

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Brunei Darussalam</th>
<th>Cambodia</th>
<th>Indonesia</th>
<th>Lao People's Democratic Republic</th>
<th>Malaysia</th>
<th>Myanmar</th>
<th>Philippines</th>
<th>Singapore</th>
<th>Thailand</th>
</tr>
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<tbody>
<tr>
<td>2011</td>
<td>75</td>
<td>50</td>
<td>65</td>
<td>50</td>
<td>50</td>
<td>55</td>
<td>45</td>
<td>20</td>
<td>70</td>
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<tr>
<td>2012</td>
<td>75</td>
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<td>65</td>
<td>55</td>
<td>55</td>
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<td>50</td>
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<td>65</td>
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<tr>
<td>2013</td>
<td>75</td>
<td>55</td>
<td>65</td>
<td>55</td>
<td>55</td>
<td>60</td>
<td>50</td>
<td>20</td>
<td>65</td>
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<tr>
<td>2014</td>
<td>75</td>
<td>55</td>
<td>65</td>
<td>55</td>
<td>55</td>
<td>60</td>
<td>50</td>
<td>20</td>
<td>70</td>
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<tr>
<td>2015</td>
<td>75</td>
<td>55</td>
<td>65</td>
<td>55</td>
<td>55</td>
<td>60</td>
<td>50</td>
<td>20</td>
<td>70</td>
</tr>
<tr>
<td>2016</td>
<td>75</td>
<td>55</td>
<td>65</td>
<td>55</td>
<td>55</td>
<td>60</td>
<td>50</td>
<td>20</td>
<td>70</td>
</tr>
</tbody>
</table>

SOURCE: FAOSTAT
PRODUCTIVITY PERFORMANCE VS SELECTED ASEAN COUNTRIES

<table>
<thead>
<tr>
<th>Country</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philippines</td>
<td>0</td>
<td>2</td>
<td>10</td>
<td>8</td>
<td>3.30</td>
</tr>
<tr>
<td>Indonesia</td>
<td>9</td>
<td>7</td>
<td>2</td>
<td>2</td>
<td>1.85</td>
</tr>
<tr>
<td>Thailand</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td>2.32</td>
</tr>
<tr>
<td>Vietnam</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>2.25</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philippines</td>
<td>1</td>
<td>4</td>
<td>9</td>
<td>6</td>
<td>3.00</td>
</tr>
<tr>
<td>Indonesia</td>
<td>9</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>2.05</td>
</tr>
<tr>
<td>Thailand</td>
<td>7</td>
<td>5</td>
<td>6</td>
<td>1</td>
<td>2.05</td>
</tr>
<tr>
<td>Vietnam</td>
<td>3</td>
<td>7</td>
<td>1</td>
<td>5</td>
<td>2.50</td>
</tr>
</tbody>
</table>

NOTE: 1 to 4 are yield rankings, with 1 indicating the country with highest yield; and 4, the lowest. The figures show the number of crops out of 20 crops which fall within the said rankings.

SOURCE: ROLANDO T. DY, AGROBUSINESS AND RURAL PROGRESS, 2017
Slow delivery of basic agriculture services in local governments
Natural disasters

- Can disrupt the entire food system from production, processing, marketing, distribution and preparation of food

**2006 -2013**

75 disasters
25% damage & losses in agriculture= 3.8 B USD

*FAO, 2015*

Cited by Villarino, 2018
NATURAL DISASTERS

4th among countries hit by the highest number of disasters from 1995-2015 affecting 130 million people (CRED & UNSIDR 2015).

27.69 WorldRisk Index and ranks 3rd amongst 171 countries based on exposure to natural hazards, vulnerability to hazards, coping capacities and adapting capacities as presented in the WorldRisk Report 2017 (Schrader, 2017).

Cited by Villarino, 2018
Volume of Rice Production (in ‘000 MT) and El Nino occurrences, Philippines, 1980-2012 (Mohanty, 2013)

Sources:
- BAS - Palay Production (converted to milled rice)
- PAGASA – ENSO years
OTHER CAUSES OF LOW PRODUCTIVITY

- Environmental degradation
- Low investment in agriculture to increase productivity
- Low adoption of technology
- Low investment in R and D and other infrastructures
MALNUTRITION REMAINS HIGH

<table>
<thead>
<tr>
<th>Type</th>
<th>2013</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>19.1</td>
<td>21.6</td>
</tr>
<tr>
<td>Stunting</td>
<td>30.3</td>
<td>33.5</td>
</tr>
<tr>
<td>Wasting</td>
<td>7.9</td>
<td>7.1</td>
</tr>
<tr>
<td>Overweight</td>
<td>5.0</td>
<td>3.8</td>
</tr>
</tbody>
</table>
POVERTY INCIDENCE 21.6%
(PSA, 1st Sem 2015)

UNDER-5 STUNTING PREVALENCE 33.4%
(NNS, 2015)

Source: WFP Food Security and Nutrition Atlas 2017

Glunin (2018)
Good news - MAJORITY of households CAN afford Energy-only Diet

Glunng, 2018

% of HH unable to afford energy-only diet

Source: Fill the Nutrient Gap Initial Result (WFP Philippines 2018)
Bad news – up to HALF of Households CANNOT afford a NUTRITIOUS DIET

Gluning, 2018

Source: Fill the Nutrient Gap Initial Result (WFP Philippines 2018)
Food accounts for 41.4% of total family expenditure.

2018: 41.5%
Filipino household dietary intake (FNRI, 2015)

<table>
<thead>
<tr>
<th>Energy and Nutrients</th>
<th>Mean Intake</th>
<th>Proportion of households that met RENI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy (kcal)*</td>
<td>1810</td>
<td></td>
</tr>
<tr>
<td>Protein (g)**</td>
<td>56.5</td>
<td></td>
</tr>
<tr>
<td>Iron (mg)**</td>
<td>9.4</td>
<td></td>
</tr>
<tr>
<td>Calcium (g)**</td>
<td>0.39</td>
<td></td>
</tr>
<tr>
<td>Vitamin A (mcg RE)**</td>
<td>519.5</td>
<td></td>
</tr>
<tr>
<td>Thiamin (mg)**</td>
<td>0.82</td>
<td></td>
</tr>
<tr>
<td>Riboflavin (mg)**</td>
<td>0.75</td>
<td></td>
</tr>
<tr>
<td>Niacin (mg)**</td>
<td>18.3</td>
<td></td>
</tr>
<tr>
<td>Vitamin C (mg)**</td>
<td>43.9</td>
<td></td>
</tr>
</tbody>
</table>

Note: The proportion values indicate the percentage of households meeting the Recommended Dietary Intake (RENI) for each nutrient.
• Filipino households’ food consumption pattern (per capita)

Cited by Villarino, 2018
Filipino households’ energy and nutrient intakes

Energy (kcal)

- Poor
- Middle-class to rich

Macronutrient intake:
- Protein
- Fats
- CHO

FNRI, 2015

Cited by Villarino, 2018
• Filipino households’ nutrient intakes

Cited by Villarino, 2018
• Filipino household food consumption profile

**Daily food value (per capita)**

- Poor: 40 PhP
- Middle class to rich: 70 PhP

**Daily mean capita food consumption**

- Poor: 750 g
- Middle class to rich: 900 g

*FNRI, 2015*

Cited by Villarino, 2018
• Urban households’ consumption pattern (per capita)

Rural: 846 g
Urban: 862 g

Cited by Villarino, 2018
• Urban households’ energy and nutrient intakes (per capita)

FNRI, 2015

Cited by Villarino, 2018
Includes both food loss and food waste which refer to the decrease of food intended for human consumption in subsequent stages of the food supply chain (FAO, 2011).

- **FOOD LOSS**
  - Takes place at Production
  - Post-harvest
  - Processing
  - and Distribution

- **FOOD WASTE**
  - Happens at Retail
  - Consumption

Capanzana, (2018)
HIGHER POSTHARVEST LOSSES
FRUITS 28%
VEGETABLES 42%
RICE 16%
Mean per capita total plate waste: Philippines, 2003-2015


Capanzana, 2018)
Calories LOST OR WASTED per person, per day from total plate waste

64 kcal

This is equivalent to a total of 5B kcal that can supply 2.5M Filipinos with 2000 kcal requirement


2003
64 kcal
2008
39 kcal
2013
57 kcal
2015
50 kcal

Capanzana, 2018)
Protein LOST OR WASTED per person, per day from plate waste


Capanzana, 2018)
QUALITY OF FRESH PRODUCE CAN BE LOST DURING HANDLING

Serrano, 2018
Ambient Storage

Increase in Vitamin C in pineapple and other fruits

Loss in Vitamin C in:
- Citrus
- Leafy vegetables and green beans
- Asparagus not in held under shade
- Spinach and other leafy vegetables = wilting due to ambient holding for 50 hrs results in loss by as high as 80% of ascorbic acid and 50% of carotene levels
- Potato = 50% loss during 4 mos. of ambient storage

β-carotene (yellow color) synthesis in tomato

Serrano, 2018
PRICE OF FOOD

Factor of production efficiency, inflation, market, transport, seasonality of food, taxes etc

Buying capacity of consumers

- **Fuel prices vs SWS hunger incidence** ($r=0.971$, $p=0.001$);
- **Peso-dollar exchange rates vs SWS hunger incidence** ($r=-0.943$, $p=0.005$)

ACCESS TO FOOD
RICE TARIFFICATION: A BOON TO RICE INDUSTRY?
The way Forward
GOAL 2: END HUNGER, ACHIEVE FOOD SECURITY AND IMPROVED NUTRITION AND PROMOTE SUSTAINABLE AGRICULTURE

By 2030

- end hunger and ensure access by all people
- end all forms of malnutrition
- **double the agricultural productivity and incomes of small-scale food producers**
- ensure sustainable food production systems and implement resilient agricultural practices
- increase investment in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks
- adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information

Capanzana, 2018
GOAL 3: ENSURE HEALTHY LIVES AND PROMOTE WELL BEING FOR ALL AT ALL AGES

By 2030

- reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being
- support the research and development of vaccines and medicines for the communicable and non-communicable diseases
- strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks

Capanzana, 2018
GOAL 12: ENSURE SUSTAINABLE CONSUMPTION AND PRODUCTION PATTERNS

By 2030

- Implement the 10-year framework of programmes on sustainable consumption and production, all countries taking action
- Halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains
- Substantially reduce waste generation through prevention, reduction, recycling and reuse
- Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production

Capanzana, 2018
Improve the agricultural sector, improving technology from farm to market and better postharvest and processing technologies

Reduce food loss and wastage
- Reduction of poverty and increase in farm and household income
- Reduction of price of food through efficient production, processing, market and distribution
- Reduce inflation due to increase in world fuel prices
- Increase employment/livelihood
PDP 2017-2022 Chapter 8: List of Strategies

SO A: Economic opportunities in AFF expanded

SSO 1: AFF productivity within ecological limit improved
- Develop an integrated color-coded agricultural map
- Accelerate construction of disaster and climate resilient small scale irrigation systems and retrofit existing ones
- Facilitate use of farm and fishery machinery and equipment
- Strengthen extension system
- Pursue ecosystems approach to fisheries management

SSO 2: AFF-based enterprises increased
- Diversify into commodities with high-value adding and market potential
- Expand AFF-based enterprises through new and innovative production and marketing schemes
- Strengthen community-based enterprises in upland communities

SO B: Access to economic opportunities of small farmers and fisherfolk increased

SSO 1: Access to value chains increased
- Physically link production areas to markets
- Organize small farmers and fisherfolk into formal groups and farms into clusters
- Provide capacity building for small farmers and fisherfolk on value adding
- Provide non-farm livelihood options especially to seasonal farm and fishery workers

SSO 2: Access to innovative financing increased
- Increase the number of small farmers and fisherfolk that are provided with agricultural insurance
- Provide small farmers and fisherfolk easy access to affordable formal credit

SSO 3: Access to technology increased
- Raise investments in R&D
- Enhance capacity of small farmers and fisherfolk to use better and new technologies

SSO 4: Access of small farmers and fisherfolk to land and water resources increased and protected
- Ensure and protect land tenure security of ARIs
- Fast track the resolution of agrarian related cases
- Revisit Section 20 of the Local Government Code
- Complete delineation of municipal waters
Modernization of agriculture
Industrialization of agriculture
Promotion of exports
Farm consolidation
Infrastructure development
Roadmap development
Legislative support

DA 8 PARADIGMS TO IMPROVE THE AGRICULTURE SECTOR (2019)
Food security is interdisciplinary and involves multi-agency participation. DA should serve as coordinating agency on food security with other agencies which include:
FOOD SECURITY

AVAILABILITY

STABILITY

ACCESSIBILITY

UTILIZATION

DENR
DAR
DA
DILG
DOLE

DOTr
DND
DPWH
DTI

DOH
DSWD
DOST
Coordinated and Integrated Programs to ACHIEVE FOOD SECURITY

BETWEEN NATIONAL AND LOCAL AGENCIES
WITHIN NATIONAL AGENCIES
EFFICIENT PROGRAM PLANNING AND IMPLEMENTATION
Marami pong salamat