“Science and the Sustainable Development Goals: the role of academies”
Korea, April 2019

IAP and SDGs: Food and Nutrition Security and Agriculture Project: the AASSA Report

A Report from the Association of Academies and Societies of Sciences in Asia (AASSA)
Rapporteur: Distinguished Professor Paul J Moughan, Riddet Institute, Massey University, New Zealand

The Association of Academies and Societies of Sciences in Asia (AASSA):

> The regional IAP network for Asia/Pacific
> Secretariat: The Korean Academy of Science and Technology (KAST), Seoul, Korea
> Led a major collaborative study on Food Security in Asia and the Pacific. Published, March, 2018.
What is different about the AASSA approach?

> Leading scientists from academies across region.
> Drawn from a wide geographical area and across science disciplines.
> A “bottom-up” analysis.
> “Synthesis” (using a food-systems approach) to develop common themes.
> Peer-review and sign-off from the region’s Science Academies (ie co-operative, authoritative).
> Informed by the UN Sustainable Development Goals.
> IAP is ideally placed to undertake such collaborative, cross-disciplinary high-level studies.

The study directly addresses:

SDG 17: Partnerships for the Goals

But also: Goal 1: No poverty
Goal 2: Zero hunger

Particular focus of AASSA: Goal 3: Good health and well-being

Goal 12: Responsible production and consumption
Goal 13: Climate actions
Goal 14: Life below water
Goal 15: Life on land
The Challenge

The Asia/Pacific Region faces a formidable challenge over the next 20 to 30 years.

The world population is growing exponentially

<table>
<thead>
<tr>
<th>Country</th>
<th>2015</th>
<th>2050 (projected)</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>1311</td>
<td>1705 million</td>
</tr>
<tr>
<td>Indonesia</td>
<td>258</td>
<td>322 million</td>
</tr>
<tr>
<td>Japan</td>
<td>127</td>
<td>107 million</td>
</tr>
<tr>
<td>China</td>
<td>1377</td>
<td>1348 million</td>
</tr>
</tbody>
</table>

Much of this growth is in Asia: 2015 | 2050 (projected)
4.4 | 5.3 billion
Expanding Middle Class

Source: Kharas and Gertz (2010).

A Surge in the Global Middle Class

Already:

- World-wide 842 million people suffer P/E malnutrition.
- Two billion people suffer “hidden hunger”.

Major issue in Asia/Pacific

IFPRI Global Hunger Index

<table>
<thead>
<tr>
<th>Country</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>29</td>
</tr>
<tr>
<td>Indonesia</td>
<td>22</td>
</tr>
<tr>
<td>Pakistan</td>
<td>34</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>30</td>
</tr>
<tr>
<td>Yemen</td>
<td>34</td>
</tr>
<tr>
<td>North Korea</td>
<td>34</td>
</tr>
</tbody>
</table>

Score >20 = serious under-nutrition.
At the same time:

There is an “obesity epidemic” world-wide.

A Looming issue in Asia/Pacific

<table>
<thead>
<tr>
<th>Overweight children (2010)</th>
<th>% of age group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>23</td>
</tr>
<tr>
<td>China</td>
<td>20</td>
</tr>
<tr>
<td>India</td>
<td>20</td>
</tr>
<tr>
<td>Israel</td>
<td>22</td>
</tr>
<tr>
<td>Japan</td>
<td>20</td>
</tr>
<tr>
<td>South Korea</td>
<td>17-23</td>
</tr>
</tbody>
</table>

Exacerbated by Climate Change

An uncertain future for food production.
Also exacerbated by Biofuel Production

Land use for fuel competes with food

↑ Ethanol
↓ Food

Overall Implications

> World will need to produce 70% more food by 2050 (IFPRI, 2016).
> Not just more food, but healthier foods (Food and Nutritional Security).
> Also, need to reduce agriculture’s impact on land, water and other resources, as well as its impact on climate change (sustainable production).
Key findings of the AASSA Report

> The future poses a significant challenge to sustainably feed a rapidly growing (and ageing) population.
> Both under- and over-nutrition are challenges.
> Need to address numerous non-technical factors, but **Science and Technology** take “centre-stage”.
> Food and Nutrition Security is more than simple calorie provision. An urgent need to define “healthy diets” regionally and locally.
> “Food wastage” is as important as “food supply” (food technology).
> Strategies need to be evidence-based.

Key findings of the AASSA Report (continued)

Countries in region identified as particularly “high risk” (high population growth, high GHI) for future FNS: **Afghanistan, Bangladesh, Cambodia, India, Indonesia, Iraq, Myanmar, Nepal, Pakistan, Philippines, Syrian Arab Republic, Tajikistan, Yemen** – a rational starting-point as to where work may be most effective.

Systems analysis needs to be applied within these Countries, to identify **key impediments**, and to develop a **“blueprint”** for education, research (S&T) and extension.
Provision of “Balanced Nutrients” not just “Calories”, resonated strongly:

- Meeting calorie needs is crucial, but not sufficient.
- Need diets that meet the daily requirements of all of the essential nutrients.
- Many Asian diets meet the ‘calories’ need but not other nutrients (especially micro elements, vitamins and some amino acids).
- There are also other dietary components underpinning health (eg natural bioactive peptides, natural probiotics, phyto-chemicals, effects of food structures).
- Need to define and work towards “Healthy Diets” – they will be culturally specific.

India
This example of a child’s meal in India includes wheat, eggplant, and potato.

What’s missing?
- Vitamin A: 62 percent of children under five are deficient in vitamin A.
- Iodine: Only 71 percent of households consume adequately iodized salt.
- Iron: 70 percent of children under five are anaemic.

Provision of “Balanced Nutrients” not just “Calories”, resonated strongly:

“Diversity of foods and food types alone, is not the answer”.


“Holistic properties of foods and diets are as important as nutrients”.

Provision of “Balanced Nutrients” not just “Calories”, resonated strongly:

The definition and description of a “healthy” acceptable and affordable diet is a complex issue, and should be a central research focus.

- See Recent discussion and debate around the EAT-Lancet diet (the Lancet, January, 2019)

FNS should be based on scientific evidence not anecdote:

Simple example: Effect of Protein Quality

Average daily per capita protein consumption relative to average daily protein requirement (countries and territories, grams protein/capita/day, 2009)

When plant protein is corrected by a factor of 0.6 (utilisability), the argument of excess protein intakes comes into perspective.
“Bottom-line Messages”: AASSA Report

The report embodies 31 key recommendations for Asia and the Pacific. **Overarching Recommendations focus on S&T:**

- There needs to be public dissemination of factual science-based information regarding FNS and particularly the role of agricultural biotechnology in providing safe, sustainable “healthy” diets.

- Cross-nation, inter-disciplinary Centres of Research and Educational Excellence (“best-of-the-best”) should be formed **now** to focus on defined issues.
“Bottom-line Messages”: AASSA Report

- A trans-national FNS funding mechanism needs to be established for the Asia/Pacific region (similar to that in Europe) to allow cooperative inter-disciplinary research to resolve common problems – **there is an urgent need to re-invigorate agri-food research.**

If Asia is to progress the SDG’s a united (cross-academy, cross disciplinary) approach is vital.

> AASSA focus has been on SDG’s 2 and 3 for nutrition and health with strong interconnection to SDG’s 12, 13, 14 and 15.
> But other SDG’s have also been highlighted:
  > SDG 4 - quality education and informing the public
  > SDG 7 - biofuel production - competition for land use
  > SDG 10 - reduced inequalities - ensuring access to sustainable, healthy diets
  > SDG 17 - partnership - in research and education, across the region and between academies
Concluding quote:

“Increasing pressures from population growth, urbanisation, land availability, resource and water availability, pollution, global climate change and loss of biodiversity conspire to make Food and Nutrition Security a formidable near-term challenge. Science offers solutions, but plans need to be made now, and enacted boldly and decisively if catastrophe and great suffering are to be avoided.”

- From the AASSA Report (2018)

Thank you