

*“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

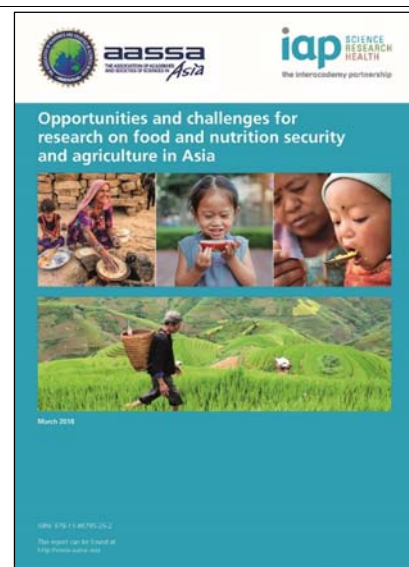
A Report from the **Association of Academies and Societies of Sciences in Asia (AASSA)**

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

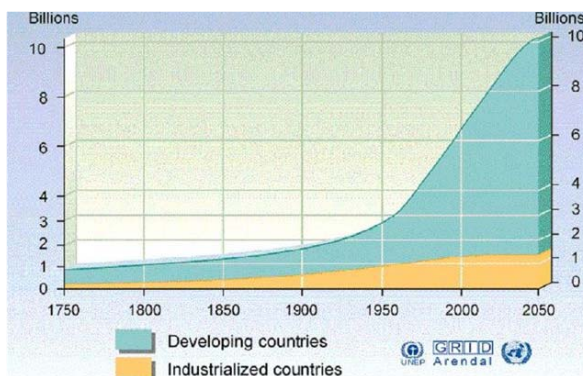


The Challenge

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



The world population is growing exponentially



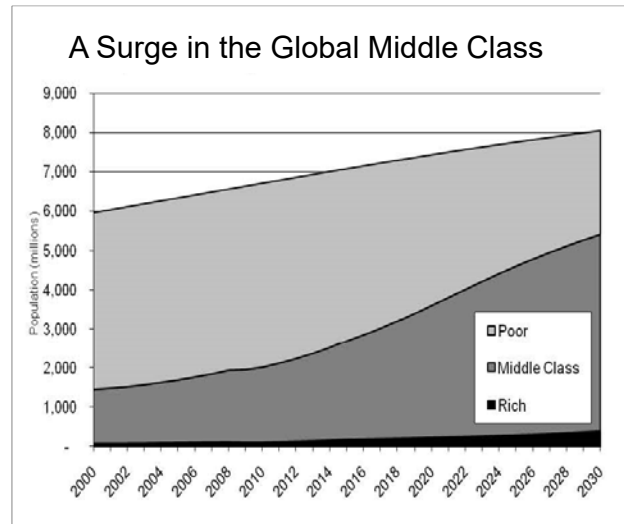
Much of this growth is in Asia:

2015	2050 (projected)
4.4	5.3 bill

But variable:

	2015	2050 (projected)
India	1311	1705 mill
Indonesia	258	322 mill
Japan	127	107 mill
China	1377	1348 mill

Expanding Middle Class



Source: Kharas and Gertz (2010).

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

India	29
Indonesia	22
Pakistan	34
Tajikistan	30
Yemen	34
North Korea	34

Score >20 = serious under-nutrition.



At the same time:

There is an “obesity epidemic” world-wide.

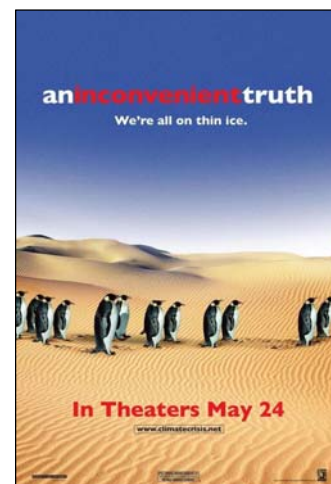
A Looming issue in Asia/Pacific

Overweight children (2010)	% of age group
Australia	23
China	20
India	20
Israel	22
Japan	20
South Korea	17-23



Exacerbated by Climate Change

An uncertain future for food production.



Also exacerbated by Biofuel Production

Land use for
fuel competes
with food

↑ Ethanol

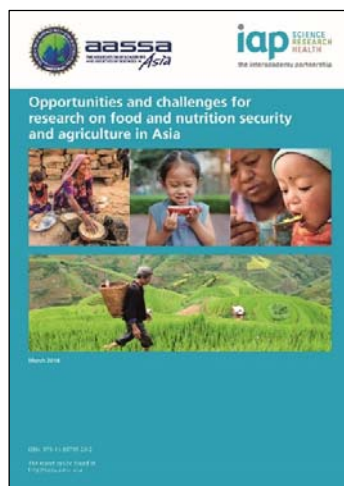
↓ Food



Overall Implications

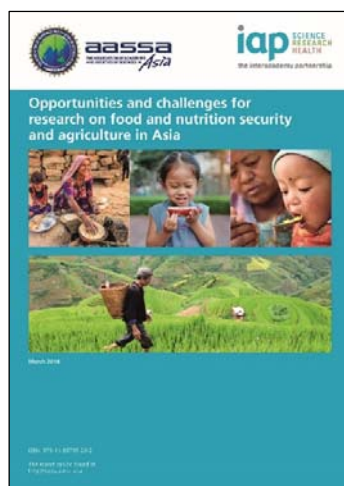
- > World will need to produce 70% more food by 2050 (IFPRI, 2016).
- > Not just **more** food, but **healthier** foods (Food and **Nutritional** Security).
- > Also, need to reduce agriculture's impact on land, water and other resources, as well as its impact on climate change (sustainable production).

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

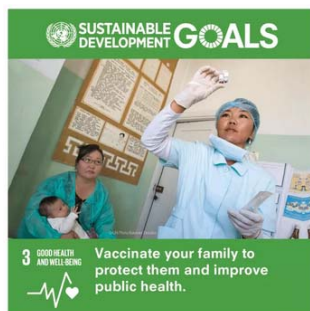
This example of a child's meal in India includes wheat, eggplant, and potato.

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”.



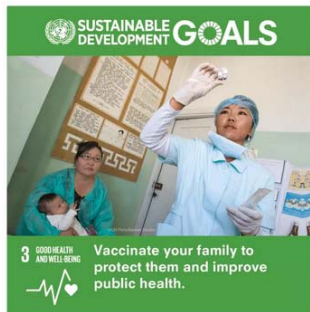
Goal 3: Good Health and Well-Being

Dietary Diversity: Implications for obesity prevention in adult populations – a Science Advisory from the American Heart Association (2018) de Oliveira *et al.* *Circulation* 138: e160-e168.

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

Holistic properties of foods: A changing paradigm in human nutrition (2018) Moughan, P.J., *Journal of the Science of Food and Agriculture*. DOI: 10.1002/jsfa.8997.

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



Goal 3: Good Health and Well-Being

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)*

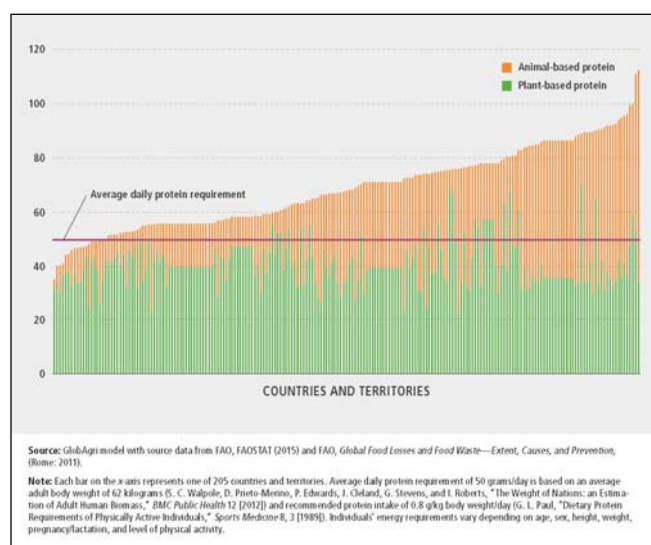


FNS should be based on scientific evidence not anecdote:

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.



“Bottom-line Messages”: AASSA Report

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

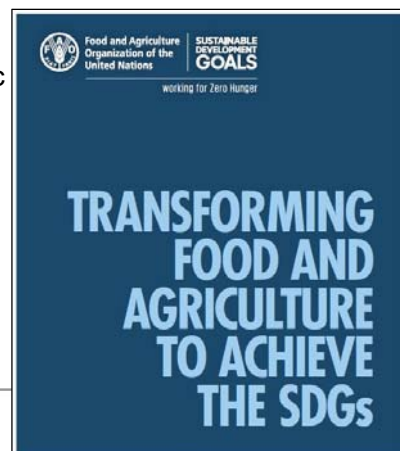


“Bottom-line Messages”: AASSA Report

- ❖ 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

